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Procedures in:

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N.A.A. BULLETIN

Vol. XLII No. 10 June, 1961

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This *Bulletin* is published monthly by the National Association of Accountants, 505 Park Ave., New York 22, N. Y. Subscription price $10 a year, for members only. Second class postage paid at New York, N. Y.

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"Step Reporting" for Responsibility Accounting

by STUART A. CLARKE

ACCOUNTANTS must agree that financial statements are merely a means of communication. However, they are the *prime* source of financial and operating information. Financial statements should mean something to the person reading them and should provide decision-making information. They must be designed with the information needs of the specific reader in mind.

Generally speaking, financial statements fall into two principal categories: (1) annual statements to stockholders and others and (2) internal operating statements prepared for the use of management throughout the year on a periodic basis. We shall confine ourselves here to the latter statements, which provide management with the means to control costs.

Analysis of Objectives of Operating Reports

The periodic internal operating statements to management are the statements that accountants should evaluate in terms of their usefulness and effectiveness. Accounting reports to management, while they may be correct as far as the figures are concerned, are frequently as outmoded as the horse and buggy. Reports to management should be designed to tell the whole story—not only *what* happened, but *who* is responsible.

Again speaking in generalities, the cost reporting which is done in many companies is designed to provide historical cost information only, largely ignoring cost control requirements. Such historical cost systems of reporting do, however, provide several kinds of necessary information, such as the company's over-all operating results, unit costs for pricing inventory, and cost data for setting sales prices. An accounting system which is set up to satisfy only these requirements, does not necessarily provide cost information in a way that is most effective for cost control purposes. Effective cost control can be achieved only if the following conditions are met:

1. *The accounting and reporting system permits control of expenditures* by directly relating the reports of expenditures to the individuals in the company organization who are responsible for their control.

2. *The system results in the preparation of accounting statements*

STUART A. CLARKE is a Manager in the Administrative Services Division of Arthur Andersen & Co., Los Angeles, California. Mr. Clarke is a graduate of University of Southern California, with a B.S. degree in Accounting.

for all levels of management, designed primarily so that such statements can be effectively used by the operating people as a tool in controlling the cost of their operations.

3. *The information shown in the report emphasizes data that is useful to the operating management* and de-emphasizes the bookkeeping aspects that clutter up most conventional operating reports.

Elements of a Good Cost Control System

The success of any system depends upon fundamentals which must be applied in order to achieve the results for which the system was designed. In cost control, these fundamentals are: (1) fixing the responsibility for control, (2) measuring the performance of control and (3) limiting the control effort to controllable costs.

Fixing the Responsibility for Control. The system must provide a method for assigning the responsibility for the control of costs to specific individuals. Definite lines of authority for the conduct of operations of a company must be established. The organization chart depicted in Exhibit 1 presents a hypothetical organizational structure with clear-cut lines of authority. Following such lines of authority, the supervisory responsibility for the various departments must be assigned to specific individuals. Each individual supervisor should also be assigned the responsibility for the control of the costs of his own operation. These lines of authority and delegations of responsibility must recognize the actual practices which the company follows. An artificial organization chart and the associated reporting system would be of little value.

Measuring the Performance of Control. Another essential element of a good cost control system is the use of budgets. With this emphasis on budgeting, some of the concepts of a good budget system should be established.

In the author's opinion, a good budget system must be based on two essential principles. First, the budget for the entire company should be a combination of all the individual departmental budgets, plus certain items included on a company-wide basis only. In other words, the budgets of the various departments must be considered as integral parts of the over-all company budget.

Second, a budget system cannot be fully effective unless the individual department heads participate in the establishment of their own budgets. If the budget is prepared without his assistance, the department head will generally consider it unrealistic and unworkable. If it is necessary to modify the original budget when it is reviewed, the changes should be thoroughly discussed with the individuals who prepared the original budget, and they should be given

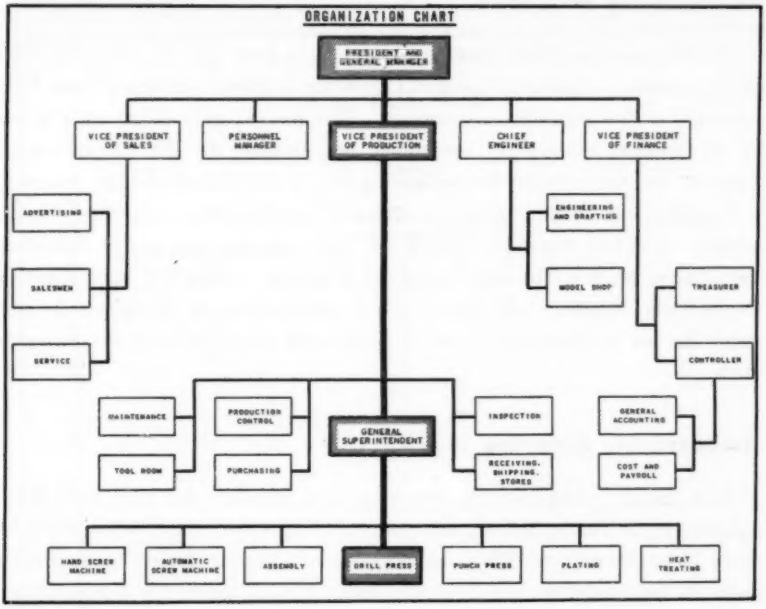

EXHIBIT 1

adequate explanation for the changes. It should be emphasized to each individual that he is responsible for keeping his costs within the final budget and that he will be expected to explain variations from it.

Limiting the Control Effort to Controllable Costs. Applying the same general philosophy that an individual who will be responsible for living within the budget should help prepare it, we should recognize the third important feature of a good cost control system, that the individual department head should be held responsible for only those costs which he can actually control. If he receives a report that includes items over which he has no control, and these items affect the over-all variance, he loses some incentive for holding his costs within the budget. No doubt many accountants have heard supervisors complain during the review of their cost reports that they have no idea what they are supposed to do about the allocations which are tacked on, or why they should have to explain the variances for these items. Even though these items may represent a very small part of the total budget, they open the door to shrugging off the responsibility for all controllable items.

Responsibility for Control

To this point, the three essential elements of a good cost control system have been discussed. A generally accepted term for a system containing these three elements is "responsibility accounting." This term is appropriate since it ties in to the responsibility for operations, responsibility for the preparation of budgets, and responsibility for controlling costs and explaining budget variances.

Responsibility accounting is very similar to departmental accounting with the notable exception that only controllable costs are reported to the individual department heads. The noncontrollable expenses, embracing such items as depreciation, insurance and taxes, are not included in any departmental statement, but are included in the over-all budget and controlled on a company-wide basis.

Responsibility Reporting

In a system of responsibility reporting, it is necessary that each level of responsibility be clearly defined, since the reporting system must follow the exact lines of responsibility. When an organization chart is designed along these lines of responsibility, it will usually differ from a conventional organization chart. The notable difference is in the area of staff positions, which are usually shown on conventional organization charts as separate functions to the side of the individual to whom they report. In a responsibility accounting system, staff functions are either (a) included in the department being served or (b) shown as a separate responsibility department under the department being served. To illustrate the statements prepared under a responsibility accounting system, the lines of responsibility in the organization shart shown on Exhibit 1 lead from the drill press foreman to the general superintendent, the vice president of production and, finally, the president.

For each level of responsibility, a specially designed report is tailored to the specific needs of the particular person who is responsible for that level. The statements for the various persons throughout the company must be designed on a basis that affords them the best control over their costs. The drill press foreman, as well as any other individual who has been assigned responsibility for controlling costs of a certain segment of the company, receives a statement similar to the one shown in Exhibit 2. As can be seen, the individual elements of costs are budgeted at the commensurate level, and variances from budgets by element (supplies, small tools, etc.) are set forth. It should also be noted that the budget amounts have been purposely omitted since they add nothing

DRILL PRESS COSTS

(Foreman)	Amount		(Over) or Under Budget	
	THIS MONTH	YEAR TO DATE	THIS MONTH	YEAR TO DATE
CONTROLLABLE EXPENSES-				
Supervision	$ 350	$ 2,100	$ -	$ -
Setup	175	910	(10)	40
Repair and rework	230	1,215	20	35
Overtime premium	215	1,145	(25)	(215)
Supplies	95	545	(10)	(5)
Small tools	115	625	20	(35)
Other	285	1,620	40	85
Total	$1,465	$ 8,160	$ 35	($ 95)

	Standard		Variance	
	THIS MONTH	YEAR TO DATE	THIS MONTH	YEAR TO DATE
PRODUCTIVE LABOR--				
Amount	$2,550	$14,250	$250	$400
Hours	1,700	9,500	50	90
Per hour	$ 1.50	$ 1.50	$.15	$.05

EXHIBIT 2

to the information already presented on the statement. An over-budget condition is shown as a credit figure since this is an unfavorable variance that should be highlighted for the individual receiving the statement.

The individual-line items included as controllable expenses are those items which were assigned to this particular department; in other words, each department has its own chart of accounts. The line items should be established with the assistance of the department head. This tailoring of the breakdown of the departmental total must provide maximum aid to the department head in the control of his costs, since he is the one who will prepare the budget, incur the costs, and be accountable for variations from the budget. It should be emphasized that the statement does not include any costs which are not controllable by the drill press foreman, such as depreciation, insurance, taxes, etc. These items are budgeted and controlled on a company-wide basis only. Since this is a production department, the statement shows the productive labor experience.

PRODUCTIVE DEPARTMENTAL COST SUMMARY

(General Superintendent)

	Amount		(Over) or Under Budget	
	THIS MONTH	YEAR TO DATE	THIS MONTH	YEAR TO DATE
CONTROLLABLE EXPENSES-				
General superintendent's office	$ 960	$ 6,380	($ 115)	($ 675)
Drill press	1,465	8,160	35	(95)
Automatic screw machine	2,845	17,445	(65)	75
Hand screw machine	3,115	18,085	90	(135)
Punch press	5,740	33,635	(65)	(1,240)
Plating	1,865	9,795	(175)	825
Heat treating	3,195	18,015	210	35
Assembly	5,340	35,845	(625)	(1,380)
Total	$24,525	$147,280	($ 710)	($2,590)

	Standard		Variance	
	THIS MONTH	YEAR TO DATE	THIS MONTH	YEAR TO DATE
PRODUCTIVE LABOR-				
Drill press	$ 2,550	$ 14,250	$ 250	$ 400
Automatic screw machine	1,310	7,890	110	740
Hand screw machine	5,240	31,760	540	1,560
Punch press	3,720	23,850	215	940
Plating	1,410	7,370	155	1,410
Heat treating	1,630	8,510	180	390
Assembly	11,260	68,340	1,570	(310)
Total	$27,120	$161,970	$3,020	$5,130

EXHIBIT 3

The totals of the controllable expenses and productive labor from this statement are then carried forward to the summary-type statement of the next higher level of responsibility. The general superintendent receives a statement summarizing all the controllable costs over which he is responsible, as shown in Exhibit 3. Such controllable costs are presented as department totals instead of expense classifications shown in the departmental statements. The general superintendent also receives a detailed statement of his own departmental expenses, with the breakdown of the expense classifications which he requires as a control of his own office costs.

This build-up of expenses by levels of responsibility continues up to the report for the president. The president receives a statement as shown in Exhibit 4, which summarizes all the controllable expenses for the company by major areas of responsibility. These are the same major areas that were represented by the top line on the organization chart. This responsibility summary report

DEPARTMENTAL COST SUMMARY

(President and General Manager)	Amount		(Over) or Under Budget	
	THIS MONTH	YEAR TO DATE	THIS MONTH	YEAR TO DATE
CONTROLLABLE EXPENSES-				
President's office	$ 3,120	$ 18,410	($ 30)	($ 155)
V. P. production	42,635	254,705	(1,020)	(3,655)
Chief engineer	7,520	44,830	135	780
Personnel manager	2,540	15,135	(40)	90
V. P. sales	25,860	151,380	(345)	(670)
V. P. finance	9,230	55,460	(85)	125
Total	$90,905	$539,920	($1,385)	($3,485)

	Standard		Variance	
	THIS MONTH	YEAR TO DATE	THIS MONTH	YEAR TO DATE
PRODUCTIVE LABOR	$27,120	$161,970	$3,020	$5,130

EXHIBIT 4

STATEMENT OF INCOME AND EXPENSE

	Actual		(Over) or Under Budget	
	THIS MONTH	YEAR TO DATE	THIS MONTH	YEAR TO DATE
NET SALES	$374,235	$2,120,680	$ 765	($20,680)
COST OF SALES-				
Standard	$248,140	$1,415,905	$1,860	(15,905)
Variances	14,890	46,490	(9,890)	(16,490)
Total	$263,030	$1,462,395	($8,030)	($32,395)
Gross profit from sales	$111,205	$ 658,285	$8,795	$11,715
EXPENSES-				
Selling	$ 27,950	$ 171,740	($ 375)	($ 735)
General and administrative	14,945	83,080	(140)	(60)
Total	$ 42,895	$ 254,820	($ 515)	($ 795)
Net profit before taxes	$ 68,310	$ 403,465	$9,310	$12,510
PROVISION FOR FEDERAL INCOME TAXES	35,520	209,950	4,840	6,505
Net profit for period	$ 32,790	$ 193,515	$4,470	$ 6,005

EXHIBIT 5

for the entire company is the means by which the president controls the costs on an over-all, company-wide basis. The over/under budget total, as shown on this statement, represents the amount of variance from the budget for all controllable expenses of the company.

Responsibility vs. Conventional Reporting

The responsibility accounting system as illustrated must still meet the requirements of producing conventional statements of income and expense. The same is also true for any other type of statements, such as unit product cost statements, which may be needed by the company.

To illustrate the conversion from a responsibility to a conventional basis, let us first look at a typical income statement, as shown in Exhibit 5. The income statement includes a comparison of the budget against actual income and expenses. Obviously, the reporting system is incomplete unless the aggregate of the departmental budgets are combined with the noncontrollable costs to arrive at an over-all total for comparison. The actual operations of the company can then be compared with the planned objective, including a comparison of actual and forecast sales.

The techniques of conversion can best be illustrated by the work-sheet shown in Exhibit 6. The column on the left represents the total costs incurred for the period, the other columns show the distribution of the costs into conventional classifications.

The total costs incurred include the controllable expenses by department as shown on the president's summary. The productive labor at actual is then included to arrive at the total of expenses shown in the responsibility statements. To this are added the costs not assigned to a particular responsibility department, which would include raw material used and noncontrollable expenses. The over-all cost of material is usually excluded from any production department's controllable expenses. No one department head normally has control over raw material because of the difficulty in assigning responsibility for both the cost and usage of the material.

The total controllable expenses of each of the major areas of responsibility have now been classified into conventional expense categories. Actually, the conversion is not completed, since a responsibility accounting system generally requires that certain cost transfers be made. For example, cost accounting expenses may be the responsibility of the controller but for conventional accounting purposes they are a part of manufacturing overhead.

The specific transfers shown in the illustration are $965 of plant accounting

TRANSLATION OF DEPARTMENTAL COSTS TO CONVENTIONAL CLASSIFICATIONS

		Distributed to Conventional Classification		
	Total Expenses	Cost of Sales	Selling Expenses	General and Administrative
CONTROLLABLE EXPENSES-				
President's office	$ 3,120	$ -	$ -	$ 3,120
V. P. production	42,635	42,635	-	-
Chief engineer	7,520	7,520	-	-
Personnel manager	2,540	-	-	2,540
V. P. sales	25,860	-	25,860	-
V. P. finance	9,230	-	-	9,230
Transfers	-	(285)	1,250	(965)
Departmental totals	$ 90,905			
PRODUCTIVE PAYROLL - ACTUAL	30,140	30,140	-	-
Totals- Responsibility Statements	$ 121,045			
OTHER EXPENSES -				
Material used - actual	185,965	185,965	-	-
Depreciation, taxes, insurance	10,740	8,880	840	1,020
Totals -	$ 317,750	$ 274,855	$ 27,950	$ 14,945
LESS - ADJUSTMENTS				
Inventory increase		(10,430)		
Costs capitalized		(1,395)		
Cost of sales		$ 263,030		

EXHIBIT 6

costs originally included in the financial vice president's responsibility that must be transferred to plant overhead, and $1,250 of shipping expenses included in the production vice president's responsibility that must be transferred to selling expenses. This results in a net reduction of $285 to the manufacturing costs.

Productive labor and raw material are shown as manufacturing costs. The noncontrollable costs have been assigned to manufacturing, selling, and general and administrative expense classifications in accordance with conventional accounting methods. To repeat, these items are reported to management for cost control and budget comparison on a company-wide basis only.

To arrive at the cost of sales as shown on the conventional income statement, there are two additional adjustments which must be made. One is to reflect the change in inventory and the other is to deduct "costs capitalized." Costs capitalized represent various types of costs incurred which are not charged to expense. Probably the most common type is represented by capital work orders. A company's maintenance department usually works on both capital and expense projects, and the costs of this labor pool are controlled in total, irrespective of the eventual accounting distribution of the costs. Consequently, the

company labor incurred on capital projects would be a part of the total costs incurred, but should not be included in cost of sales. Another example is clean-up work performed by the maintenance department which is billable to a contractor. In this case, the accounting charge would be to accounts receivable. Any costs incurred which are to be excluded from expense would be shown as costs capitalized.

Effective Cost Control Based upon Responsibility

The company's reporting system should give management an effective cost control, based upon the assignment of responsibility in the company. To communicate useful information required by management, a company's internal operating statements should be designed to provide clear, concise information for controlling costs of operations. It has been the author's own experience that good internal operating statements are an indication of a well managed, profitable business.

The system of responsibility accounting meets management's requirements by emphasizing three essential elements of good cost control, as follows:

1. The responsibility for the control of costs assigned to specific individuals.

2. A means of measuring the performance of each individual, established through the use of budgets. These budgets are set by the individuals and changes, if any, are made with the approval and understanding of the individuals who originally prepared the budget.

3. Only those costs that are controllable by each supervisor are charged to his department. All other costs, such as depreciation, insurance and taxes, are controlled on a company-wide basis.

It is not possible to have a successful responsibility accounting system or effective cost control without having all three of these principles in effect. The size of the company is neither a requirement nor a deterrent for the use of such a system. The concepts of good cost control through this type of reporting remain the same. The concept of responsibility accounting emphasizes that all supervisory personnel in a company are a part of management. Once top management accepts this, the assignment of cost control and the responsibility for keeping costs within the budget can become effective.

Accountants, as a part of the management team, should evaluate the company's internal operating statements to ensure that they provide effective cost control. Accountants should also take an active part in educating management in the concepts of responsibility accounting.

The Accountant's Role in Industrial Marketing

by JOHN T. O'MALLEY

THE SIZE of your company and the degree to which marketing research and distribution cost analysis can be utilized should determine how much of a role you, as an accountant, might play in this theater of endeavor. You may try out for a prime supporting role in a small company which is planning to establish marketing policies, procedures and goals. Or, at the opposite extreme, you may settle for a role as a bit player in a huge production where marketing has developed into a major segment of the company organization. Regardless of the part you play, there are same basic concepts of marketing in every script which will help you give a good performance.

Products

In the broadest sense, there are (1) consumers' goods and services and (2) industrial goods and services. If your products are designed to be sold to individuals for personal or household consumption they fall into the first group. If you sell to business or institutional buyers for use in carrying on their operations you are in the latter category.

These differences can be further clarified by explaining that consumers' goods are usually sold in small quantities, which are determined often through impulse or force-of-habit buying. Emotion, convenience, personal taste and preference predominate in their purchase, and they are sold through ubiquitous outlets. On the other hand, industrial goods are carefully purchased by professional buyers in large lots with cost, service and profitability foremost in consideration. Outlets are limited so that each sale is relatively important.

We shall not attempt to delve into the characteristics of buying establishments or product planning and development. We are more concerned with areas where we, accountants, can be starred because our experience and training makes us suitable for such roles.

Marketing Research

Marketing research is centered on studies of: (1) projection of market, (2)

JOHN T. O'MALLEY, Worcester Chapter, 1950, is Assistant Treasurer and Office Manager, Wain-Roy Corporation, Fitchburg, Massachusetts. Mr. O'Malley was graduated from Bentley School of Accounting, Boston, Mass. He is Past President of Worcester Chapter. Mr. O'Malley contributed previously to the *Bulletin*.

sales results, (3) sales forecasting, (4) customer habits, motives and attitudes, and (5) competition. There are three major marketing variables which contribute to profits: (a) volume of sales, (b) gross profit and (c) marketing expense. We shall not discuss sales volume since this is an area in which we can make only a minor contribution. The mark-up is determined by the distribution channels used to sell your products and this should be investigated carefully. We are going to concentrate most of our comments on marketing expense which covers (1) sales personnel cost, (2) advertising and promotions, and (3) distribution expenses.

Distribution Channels

Although you may have little to say about the distribution channel policy of your company, you are in a position to give management valuable facts on various gross profit margins by showing how the discount structures for specific outlets are compiled. Here are the general classifications of possible distribution channels: (1) directly to customer, often using branch houses and sales offices, or (2) indirectly, through distributors, manufacturer's and sales agents, and brokers and commission agents.

In all calculations you will need to know the estimated sales volumes expected through the particular distribution channel under consideration. Your role can better be appreciated by management through an intelligent discussion of the gross profit needed to operate successfully in any particular outlet. When you sell directly, you should know from recent historical costs how your present selling expenses are running. If direct selling is a new channel for you, you need accurate estimates on what it will cost to set up and maintain a sales department. There are many variables in establishing a new sales organization and it would be most worthwhile to find out how the mark-ups and selling expenses are averaging in related lines. These can often be obtained through data available from nation-wide mercantile agencies and government reports. Frequently, information can be obtained from trade associations and journals in your industry. There are unknown or unexpected costs in operating a new sales department, which cannot be predicted or anticipated. Until the sales organization settles into day-by-day operations, a safety factor should be allowed for these unknowns and variables which are bound to creep into its functional costs.

Discounts

If management chooses to use distributors, you may often find that trade dis-

counts have been established for similar products and you must meet or better the discounts allowed by competition (unless you can prove a higher volume with a lower margin, will result in more profits). This is also true of manufacturer's and sales agents as well as brokers and commission agents. Each channel offers advantages which should be analyzed by the marketing executives. There are quantity discounts which should be brought into the picture, not only from the competitive point of view but also as to the savings in production costs on long runs. Cash discounts may be given if finances are limited, since these discounts may help you to turn over inventory faster and make more efficient use of your working funds. Weigh this extra cost to see if gross profit should be increased to include it.

Selling Period

The time period during which you plan to sell your products is most important. It may be (1) a short run to sell items already produced, (2) an intermediate period which would allow for manufacturing and selling, or (3) a long run which would include expansion of plant and equipment in order to produce and sell the volume under consideration. You can readily compute your fixed cost under present conditions and calculate the additional fixed cost based on volume requirements. The variables, which can be computed at different volumes of production, are usually directly related to production. Semi-variables are often in a separate class since they do not vary directly with production and are subject to executive decision when it comes time to increase or decrease them. It would seem prudent to provide a safety factor at lower volumes, since management is often reluctant to reduce these costs and frequently procrastinates for months after sales have dropped off. The executives, normally optimistic and often feeling that volume will soon increase, maintain the present organization intact in anticipation of an expected upswing.

A powerful argument, frequently put forth, is that certain overhead expenses should be eliminated in making short-run price decision to get additional business. The reasoning here is that the present sales volume is carrying the fixed and semi-variable overhead costs, so the new business needs to provide for only a little more than direct cost to contribute to the net profit. Here, management must cautiously weigh the impact of doing this on the over-all policy, since the feeling may develop that other accounts should receive the same treatment. Extending the policy too far would leave some of the normal overhead unabsorbed and increase operational costs. The future relationship with the low-margin buyer might lead to inability to include the proportional share of overhead in subsequent orders. There is a danger here to small companies that accept high

volume, low profit business, because they may become dependent upon that business and end up merely as an adjunct of the larger buyer.

Cost Information for Marketing

Production costs are usually easy to calculate when the contemplated output is known. Distribution costs are not developed to the same degree as production costs and it is here that accountants can take a bow by supplying figures which will be most useful to the marketing people. There are more intangibles in marketing than in production and marketing expenses cover a much wider area. Since marketing costs, in general, are smaller than production costs, less emphasis has been placed on compiling them. However, distribution costs appear to be rising faster, relatively, than production costs. This accentuates the need for more accurate knowledge of the expenses incurred in marketing.

One of the greatest pitfalls in allocating distribution overhead by time, effort, etc., lies in accepting surmisals supplied by the sales department as if they were facts. Sales personnel concentrate on the selling aspects and they often have no concept of how to prorate the time and effort they spend on specific products or functional activities. The redistribution of customary or "natural" expenses (wages, office supplies, telephone and telegraph, etc.) to functional costs (selling, order handling, etc.) must be carefully analyzed so that the allocation will be correct. You must fully explain what each of these expenses comprises, so that marketing personnel can make judgments with a better understanding as to what is there to be apportioned. It would be well to compare the information separately supplied by individuals in private conversations rather than obtain the information from group meetings. If the estimates vary greatly with each other, then the sales people can be brought together to iron out differences.

The proper allocation of overhead is the key to accurate distribution cost analysis. You, the accountant, must also learn what the marketing functions are in order to include all related costs. Functional costs are those expenses which cover the various operations of the marketing activities. They usually have a simple expense pattern. Confusion and misunderstanding can be avoided by applying simple measuring units in allocating natural expenses to functional costs.

Do not upstage the marketing people by acting condescendingly in supplying figures or in explaining what the natural expenses entail. Give them equal billing in this show. You must win the confidence of the marketing executives so that they believe your analysis is fair and was attained by working in close cooperation with the sales department. Sales management must be assured that you

are not trying to prove that unprofitable lines and customers should be dropped. Any inference that this analysis will reduce sales volume would be like waving a red flag at a bull. It should be your job to show where and what the sales department can sell more efficiently and how, by cost analysis, to change loss lines into profitable ones. You will be more successful if you can get the entire cast on your side by asking the sales people to help you carry on the project.

Distribution Cost Analysis

Broadly speaking, all expenses incurred after the product is made are distribution costs, which are broken down into marketing functions. Do not classify personal exertions as separate marketing functions when they are merely part of another activity. Neither the size of the expenditure nor the number of people employed is a determining factor.

The first major step is to classify the marketing activities into groups which are alike in nature: selling, advertising, financing, order handling and accounting, material handling, stock carrying, transportation, market research and sales supervision. You now allocate the natural expenses by some measurable unit: (1) volume of sales, (2) volume of other costs, (3) floor space, (4) time studies, (5) careful estimates and/or (6) other methods peculiar to specific costs, as explained later. Remember that use of sales volume alone as a basis may distort results if its proration obscures the true cost of a particular sales function. It is better to leave out expenses which cannot logically be allocated or which are not under the control of the marketing management. Show these as separate costs to be deducted from profit margins.

There are some natural expenses that apply to more than one function which must be apportioned into several parts so that each marketing activity has its proper share. You can also analyze costs by products or by customers.

Simplify your work by omitting detailed apportionments of small expenses which will not materially affect results. Lump them into a common category for later allocation. Do not use a complicated or time-consuming formula if another method will provide easier prorationing. You cannot be exact in compiling costs which have to be allocated, so as least be practical and combine under one measuring unit items for which differences are negligible.

Expense Structure for Functions

Selling: salesmen's salaries, commissions, travel, meals and lodging expenses, customer entertainment, sales department salaries and wages, and the allocation of the applicable natural overhead accounts.

Advertising: all advertising connected with selling, incurred in publications, television, radio, billboards, catalogs, brochures, literature of all types, promotions, exhibits, shows. Note: It is probably better to consider goodwill advertising as part of general administrative overhead.

Financing: cash discounts allowed for prompt payment, interest on investment in and loans for accounts receivable, credit and collection expenses and applicable overhead.

Other handling and accounting: the paper work involved in processing the orders, including bills of lading, invoices, customer ledger postings, stock record posting, etc. A share of the applicable overhead expenses should be added.

Material handling: embraces such costs as packaging, shipping, delivery, order assembly, etc. A portion of overhead items is allocated to this function.

Stock carrying: the cost of maintaining storage space; interest, insurance and taxes on inventory; apportionments from overhead.

Transportation: the cost of shipping the goods to the customer, if you prepay transportation or supply delivery trucks; otherwise omit.

Marketing research: salaries of personnel and proration of overhead.

Sales supervision: salaries and expenses of sales supervisors and sales executives, allocation of administrative salaries devoted to this function plus part of usual overhead costs.

Product Allocation Yardstick

There are direct marketing function costs which can be allocated to products on bases of footage, lines of invoicing and average dollars invested. For example, interest on financing finished stock is computed on average inventory value for each product line. The lines of invoicing for each product are used in measuring the order handling and accounting function. Storage is prorated by footage of area used by each product and must include a portion of unused space unless this space is reserved for a specific line. Indirect costs, such as selling, may be allocated to products by sales dollar or by costs through time studies and review of efforts expended on each line.

Results from Analysis

After you have completed the distribution cost analysis, you study the reaction of your audience (management), since results must be used by management in their marketing decisions. Unless you have at all times explained the allocation

and disclosed all facts to the marketing people, there will be a resistance on their part to using this cost information in selling. However, if this is the first time that you have prepared a distribution cost analysis, you frequently find important by-products which you were not looking for in the original study. This data may be fully as important as the figures you started out to obtain.

For instance, the analysis should be valuable in deciding what channels of distribution should be chosen for new products. The figures may also provide a basis for later determination as to which customers are or will be unprofitable. This does not mean that we should drop any of our customers but, rather, review the expenses incurred in servicing them to see whether our salesmen are calling on them oftener than is justified. There is a probability that we may be giving our customer more service and technical assistance than his business allows. Possibly he is ordering in small quantities and at too frequent intervals. Here is where distribution cost analysis may be able to correct or reduce unprofitable areas.

Marketing cost analysis can highlight low margins while a company is reviewing its product line with the thought of eliminating unprofitable lines, especially if it is constantly adding new lines which give promise of good business to replace the old ones that may have outlived their usefulness. Do not get rid of a product which may be carrying a share of fixed and functional costs if remaining products will have to bear a greater load.

Cost of packaging done specially to meet some customers' specifications may be too expensive. Perhaps the items should be packaged in larger lots to reduce not only the packaging costs but also the handling costs.

The sales manager should be able to direct more effectively his sales efforts as a result of this cost analysis. He can emphasize the sale of goods which have the greater profit margin. Often it is possible to intensify the efforts of the salesmen on some products which are not showing a reasonable margin so that increased volume will improve their profitability. If you prepare a separate distribution cost analysis by customers, the salesman's efforts can be directed in a manner which will make his time more effective in concentrating on the more lucrative accounts.

Net Profits after Distribution Allocations

In order to complete your study of the net profit of your products, by line, you will want the following figures, whether readily obtainable from your accounting records or found by reviewing invoices, expense vouchers, prints of storage areas, sales and purchasing statistics: (1) annual sales of each product line, (2) the gross profit for each product, (3) average inventory carried for

EXHIBIT 1

EXPENSE DISTRIBUTION ANALYSIS SHEET

Natural expense account	Total	Marketing Functions Account Allocation									Not allocated
		Selling	Adv.	Financing	Order handling acct.	Material handling	Stock carrying	Trans.	Marketing research	Sales superv.	
Office salaries and wages	55,210	3,150	500		15,310			980	5,400		29,870
Factory wages	350,905					11,615		3,140			336,150
Salesmen's salaries	39,760	39,760									--
Administrative salaries	75,490									13,730	61,760
Adv. -publications	5,180		5,180								--
" -literature	3,645		3,645								--
" -promotions	2,390		2,390								--
Truck maintenance	720					315		405			--
Fuel &light	5,880	410		50	310	160	960		150	75	3,765
Group insurance	1,645	120	2		45	35		120	155		1,168
Fire insurance-bldg.	3,330	375	70	40	290	135	770		75	90	1,485
Fire insurance-stock	4,640						2,300				2,340
Bus. int. ins.	1,980	510								245	1,225
Int. on loans	6,255			1,700			3,150				1,405
Postage	1,200	180	310		370				30	55	255
Office supplies	9,495	1,840	135		3,115			65	150	95	4,095
Bldg. maintenance	3,580	360	75	50	310	140	960		35	100	1,550
Taxes - payroll	27,230	2,470	30		910	680		240	305	810	21,785
" - real estate	3,260	365	70	35	280	130	760		75	85	1,460
Tel. & tel.	8,780	3,185	25		120	120		240	385	675	4,030
Sales, travel,ent.	11,660	7,240								4,420	--
Depr. - building	110,800	1,100	200	120	900	400	2,150		240	280	5,410
" - furn. fixt.	2,795	510	510	70	830			100	280	300	705
" - auto & trucks	4,585	1,750				750		750			1,335
Totals	640,415	63,325	12,702	1,995	22,790	14,480	11,050	6,040	7,280	20,960	479,793

each line, (4) storage space taken up by finished goods for each product and (5) total lines of billing on invoices for each product.

Make a record showing the cost of goods sold and average inventory by each product group, using the annual profit and loss (income) statement as a starting point. Using preceding information as a guide, you can readily prepare an Expense Distribution Analysis Sheet (Exhibit 1), in which the natural expenses are broken down into marketing function costs. Note that only a few of the more common expenses are shown. You probably will have to review in detail what you may have included in a general expense account. For example, do not apportion insurance expenses that have no marketing connection: boiler and machinery exposition, workmen's compensation on factory employees, product liability, etc. We are assuming that you have a small advertising section which probably is part of your over-all sales department. Overhead items are, therefore, allocated. Some accounts have only a small assignment to sales activities, such as factory wages and general administrative salaries.

You continue allocation of marketing costs to each product, following the steps outlined earlier. You can then prepare a final report on net profit by each product group. Here you can see both the gross and net profit by products. It will probably be a real eye-opener. The best gross may be the smallest net, now you can show why. You can point out the total functional cost on each marketing function down to the individual product class. Management can direct cost control by assigning responsibility to certain supervisors in each of these marketing activities where the monetary size of the expense justifies closer checks. You can develop standards for these functions for future comparisons. You can incorporate these costs into budgets to improve effectiveness and accurateness of estimates supplied by sales management.

How well can you play this role?

Labor Reports—The Citrus Industry

by RALPH BRINCKLOW*

MR. A. A. COX in his article, "Assisting the Foreman Through Manufacturing Budget" *(N.A.A. Bulletin,* November, 1960), deals only briefly with daily labor reports. In our business, citrus concentrates, we con-

* Controller, Citrus Division, H. P. Hood & Sons, Inc., Dunedin, Florida.

sider our daily labor reports of utmost importance. A citrus concentrate plant operates around the clock, seven days a week, when fruit is available, for a maximum period of four to five months. Furthermore, the number of people on our plant pay roll increases with the addition of seasonal workers by 400 percent. Labor cost control is a must with us as I am sure it is with many firms. A brief description of our labor reports may be helpful.

Our two daily labor reports are forwarded to plant management (which includes supervisors and foremen) no later than 11 a.m. One report is a schedule of hours worked by every plant employee. Each of our plant cost centers is identified by a series of employee numbers which are blocked out on the report. At a glance, plant management can ascertain the number of overtime hours in each department and the number of people who contributed to the overtime.

A second report, which consists of one line and a space for comments for each department, reflects actual hours and dollars, and variance from standard on a daily and total-to-date for the week basis. Standards are not issued every day, but rather are on file in the plant office for reference when needed. The booklet of standards on file contains the standards for each job, in each department, for every day of the week.

These two simple, easy to prepare reports give plant management all the information needed for control of labor. If an operational department was below standard hours and dollars, was it because it was shorthanded? If so, has the personnel department received a request to fill the gap? If maintenance men worked overtime, does the maintenance department report indicate the reason why? These and other questions are brought out by the reports as soon as four hours and no later than twenty-eight hours after the fact, so that the reasons for variances are promptly known and efforts can be made to restore labor hours and dollars to standard.

It should be pointed out that a processing plant has to be fully manned in order to handle volumes above a minimum volume of fruit. Therefore, labor cost per unit is entirely dependent upon the volume of fruit that our fruit department can deliver. Our emphasis, therefore, is upon labor hours and dollars and not upon unit costs at this point. Knowing the daily volume upon which our standard labor unit costs are based, and knowing the actual volume received and processed, we know that labor unit costs are higher or lower than standard. In order to complete our pack requirements within the period that fruit is available, daily volumes must average out close to our standard. Therefore, a report of labor costs per unit, per major product, is issued weekly only, on a weekly and to-date basis.

Inventory Control from a Prospective Purchaser's Viewpoint

by FREDERICK C. GOSEWISCH

INVENTORY managers rarely encounter the situation where it becomes necessary to determine the value of an inventory for a product line or a going business that is sold. Though the actual situation occurs only infrequently, an analysis of how to approach such a problem can be highly instructive; the appraisal of an inventory by a prospective purchaser and the conversation between the buyer and seller is used in this article as a vehicle by which to convey some facets of the problem of managing an inventory. The fictional episode described here is intentionally distorted to the extent that the seller appears to have little or no formal program for inventory analysis. Describing the situation in this fashion, however, permits a more logical presentation of the techniques used by the purchaser.

Assuming that the amount to be paid for the inventory is the only undetermined figure in the proposed sale of a business, the following lines might be spoken by the fictional character in this fictional drama:

Seller: The inventory is in pretty good balance. The current figures show $100,000 in finished stock and $60,000 in work in process. Last year's cost of sales was $480,000, so we are getting a turnover ratio of 3 to 1. That isn't bad for this type of product, when you consider that many items are of such a nature that four to six months lead time is not unusual. I know that some of our competitors would like to be getting three turns a year on their inventories. Also, about a year ago we completed a surplus disposal program, and we got rid of all the obsolete stock that had been written off. There is very little "dead wood" in this inventory.

Buyer: You will understand, of course, that I would like to make a few tests of my own. I can appreciate your pride in your inventory control, but I must look at this inventory from a different viewpoint than you do. To begin my analysis I'm going to bring in some key-punch operators to punch some of the details from your inventory ledger cards. The first deck will contain:

FREDERICK C. GOSEWISCH, Milwaukee Chapter, 1957, is Scheduling Coordinator, Nordberg Manufacturing Company, Milwaukee, Wisconsin, where he previously served as Assistant Inventory Controller and Systems Supervisor. He is a graduate of Wittenberg College, Springfield, Ohio, and Western Reserve Law School, Cleveland, Ohio. Mr. Gosewisch is a previous contributor to the *Bulletin*.

Part number.
Unit cost, shown as one figure—material, labor and burden.
Quantity on hand.
Quantity on order—with a control-hole punch if the item is purchased, and no control hole if it is manufactured.
Estimated usage for the coming year.
Actual usage for the past year.
Lead time, expressed in months.

The unit cost which we assign for this purpose need not be based on any particular technique. It can even be a reasonable estimate. If we use a reasonable unit cost for each item and apply it equally to the usage quantities and to the inventory quantities, we will not distort the comparisons to be made. I don't care if we don't tie in with your balance sheet statistics. The objective of this study will be to measure the effectiveness of the inventory and for this purpose all that is required is a reasonable figure, consistently applied. With this information in punched card form, we can perform the extensions and some simple mathematic functions quite easily, and sorting is also a comparatively simple operation.

First, estimated usage for the coming year will be extended by the unit cost, and then actual usage for the past year will be extended by that same figure. This will be done for each item. Next we will subtract the estimated future usage value from the previous actual usage value. Since we will get both positive and negative answers, the positive answers will be put into one field of the cards and the negative answers into another. Then we will sort the positive answers into high-to-low sequence and do the same with the negative answers. With this accomplished, I can look at only the top 5 percent of each list of items and make a detailed study. In either case you should have a reasonable explanation for the difference in values, or we may have to make some adjustments. On the other hand, if there are no substantial differences between actual and estimated, I shall be very skeptical about the purchase of this business, because this would indicate that no engineering improvements have been made for at least a year.

This first analysis is really nothing more than a type of audit of your estimated usage figures, but we should get your estimated usage corrected as best we can before proceeding. You recognize, of course, that the inventory I purchase will be used to meet future requirements, so I am more interested in the estimated future usage than in the previous actual usage.

Now that the first analysis is completed and the cards are corrected, we shall take the second step.. This will be a straight high-to-low sequencing of the cards based on the value of estimated annual usage. This is the study frequently

called "ABC analysis," with which you are probably familiar.

Briefly, it is simply a method of classifying the items which make up the inventory in accordance with the monetary importance of each item (the quantity to be used times the unit cost). By doing so, it is possible to determine the logical "break points" in the total list, and classify the items within each category thus established. Somehow, the idea has been widely accepted that three categories is the optimum number, but any number can be established, provided that we know what to do with each category. For our purposes here, we will use the three-category breakdown because it is probably the most familiar to you.

* * *

Buyer: From this second analysis we have now divided the items into three categories as follows:

A items — 5 percent of the items, 50 percent of the total usage value. The value of annual usage ranges from $10,000 to $500.

B items — 45 percent of the items, 45 percent of the total usage value. The value of annual usage ranges from $499 to $10.

C items — 50 percent of the items, 5 percent of the total usage value. The value of annual usage ranges from $9 to $.01.

For our purposes here this will be a sufficient breakdown. The normal use of such categories is to establish the degree of control required on each item. Obviously, the A items should receive the highest degree of control and the C items the lowest. In actual practice we would break each of these three categories down according to the method of control we want to employ. For example two items on the top of the list are Part No. 45678, that shows annual usage of 10 items at a unit cost of $1,000, and Part No. 54321, with annual usage of 100,000 at a unit cost of 10¢. Both are A items and subject to a high degree of control, but they cannot be controlled by the same method. Part No. 54321 would be very susceptible to control based on a formula, because of the high usage quantity, but I would not trust Part No. 45678 to any mathematical technique, because of the obvious possibilities of erratic usage due to the small number of issues which occur. However, I digress, and we must get on with this study to come up with a fair value of the inventory for purposes of the sale of the business. You stated that your turnover is three times a year. Surely you do not aim at a single turnover ratio for all items, do you?

Seller: No, we don't. We try to keep a higher inventory of the "peanut" items, and turn the "gold" over as fast as we can.

Buyer: Highly logical, and the ABC analysis will be a help in that regard. Suppose we say that, as a general target to shoot for, we set an objective of four

turns on A items, three turns on B items and two turns on C items. These aren't hard and fast rules, but they'll work fairly well for analysis purposes. You will recall that we had the lead time punched into the original deck of cards and that we now have an "A," "B" or "C" punched into each card. Since we have set an "ideal" inventory position for each category, 3-month usage for A items, 4-month usage for B items and 6-month usage for C items, we can establish a theoretically ideal on-hand-plus-on-order position for each item. These theoretical values for A items would be:

Annual usage $\times$ Unit cost $\times$ $\frac{1}{12}$ $\times$ (L. T. plus 3).

For B items we change the last figure—lead time—to 4, and for C items to 6. For brevity we will call this value the "requisitioning objective." Remember, this represents the theoretically ideal on-hand-plus-on-order position.

You will also recall that when we punched the original deck we punched the on-hand quantity and the on-order quantity. We can now add these two figures together and extend by the unit cost. Let's call this value "inventory commitment," though, I'll admit, it isn't the most descriptive term for what it represents. Now, with these values in the cards, I want to repeat the routine of subtracting one from the other and setting the positive answers in one card field and the negative answers in another. In this case, we'll subtract inventory commitment from requisitioning objective, so that the positive answers could be called "shortages" and the negative answers "excess."

* * *

Buyer: Here are the results. I've had the totals listed for each category:

	Requisitioning objective	*Inventory commitment*	*Shortage*	*Excess*
A	$120,000	$145,000	$25,000	$50,000
B	80,000	93,000	20,000	33,000
C	10,000	12,000	5,000	7,000
	$210,000	$250,000	$50,000	$90,000

Note that in every case the following holds true:

Requisitioning objective — Shortage = Inventory commitment — Excess.

In this case: A items $95,000
B items 60,000
C items 5,000

These last-mentioned values represent that portion of the inventory commitment which is effective to meet the requisitioning objective. We could have computed

this value item by item, if we so desired, merely by selecting the smaller of the requisitioning objective value or the inventory commitment value.

From this last analysis I am able to formulate some option as to the value we should set on this inventory for purposes of the sale of this business. Since I would have to assume all of the purchase obligations for the material you have as on order, and since I must complete the open-stock orders which you have issued (or else you must admit that they shouldn't have been issued), I am as concerned with your on-order position as I am with the on-hand position. You, as the present proprietor of this business, would do the same in the event I do not purchase the business, so you are equally concerned with these values. Let's make some comparisons: the total inventory commitment is $250,000, of which $160,000 is effective to meet our predetermined requisitioning objective, which in turn is based on "target" turnover ratios and lead times.

In computing the effectiveness of your inventory policy, we must consider the shortages as well as the excesses. Therefore, we can set up the following factors as indicative of the status of the inventory:

Shortage factor	20%
Excess factor	36%

Each of these statistics is determined by equating the value of the shortage, or excess, to the effective inventory commitment. To get an over-all figure to represent the effectiveness factor, we subtract the total of these two factors from 100 percent. In this case the efficiency factor is 44 percent. You must understand the method we used to determine these factors and recognize that the efficiency factor definitely cannot be interpreted to mean that I should offer you 44 cents on the dollar for the inventory. This is a very harsh measuring stick. Its principal value is obtained only when you conduct this type of study over a period of time in order to observe the trends of each of these factors. The harshness of this means of measurement stems from the fact that almost every item contributes some value either to "shortage" or to "excess." You must recognize, when you use this method of measurement, that you get "penalized" even by those items where the inventory is sound. Look at this first item on the listing. It has a requisitioning objective of 140 pieces, and there are 85 on hand and 50 on order. The lead time is 4 months, so there is no need for any new order and the 50 that are on order should be here before you run out. But this item, priced at $10 each, has contributed $50 to the "shortage."

You can never reach a 100-percent effectiveness by this method, but if you keep in mind the way in which these statistics are computed, and realize that this is a harsh measuring stick, you can use this method to accomplish the objective of measuring the effectiveness of the inventory policy.

Seller: Really, I appreciate this lesson in inventory control, but I thought you were trying to determine the price you are willing to pay for the inventory.

Buyer: Sorry to digress again, but I wanted you to understand how I am approaching the problem. One of the difficulties in judging the effectiveness of an inventory control policy, or in trying to set a price on a total inventory, is that almost every available figure that is kept is a composite of many offsetting values. For example, a turnover ratio of 3 to 1 could conceivably be a composite of a situation where half the inventory turned 6 times and the other half didn't turn at all. I wanted you to see that, by the technique of subtracting inventory commitment from requisitioning objective and keeping the positive and negative answers separate, the excesses and deficiencies do not offset one another.

At this stage of the analysis, we are in position to take some direct action regarding the inventory. Suppose you list the "shortages" in high-to-low sequence. The list will indicate, on a fairly accurate priority basis, where you need to expedite, or to issue new orders. The same type of listing for the "excess" items will tell you where to reschedule, cancel, sell excess material back to vendors, launch a sales campaign, determine the feasibility of reworking to other parts, or any other tactic of surplus disposal. Here, again, the priorities have been established by the high-to-low sequencing of the cards. Note also that, since we put a control hole in the original cards to designate purchased items, a single pass through a sorter will produce separate decks for listing purchased items for screening by the purchasing department and make items for shop analysis. That control hole will come in handy on our next analysis, too.

And that brings me to your last question, and so to the purpose of this whole analysis: to determine the price I should pay for the inventory. Let's go back to the original deck and run an analysis similar to our last one. This time, however, we will use the total estimated annual usage instead of the requisitioning objective. We'll repeat the process of subtracting the inventory commitment from the annual usage and, again, separate the positive from negative answers. We will make one other change. Instead of classifying the items by A, B, or C, in this case we will separate the "purchase" from the "make" items.

* * *

Seller: Well, now that you have this latest report, can you make an offer on the inventory?

Buyer: Yes, I believe so. Some straight totals are being tabulated and should be available any minute. In the meantime, here are the results of the last study:

	Estimated annual usage	*Inventory commitment*	*Shortage*	*Excess*
Purchase	$150,000	$ 75,000	$ 85,000	$10,000
Make	450,000	175,000	295,000	20,000
Total	$600,000	$250,000	$380,000	$30,000

At this point I must digress once more. Note that the total annual usage is $600,000 in this report, whereas last year's cost of sales was $480,000 and you had not forecast any increase in volume. This does not mean that our figures are in error. We must recognize that in taking this approach we are not trying to "tie in" these figures with the balance-sheet statistics, we are trying to analyze only the inventory position. In those cases where parts are used to make assemblies, or where stocked castings or raw materials are used to make parts, that usage is not cost of sales. There will always be some duplication of values, both in estimated usage and in the value of inventory commitment, but as long as we are consistent in the way we draw off our figures, these duplicated values will not distort the results for the purpose for which we made the study.

If we let our thinking stray away from the objective of the study, we can get into a lot of difficulty. It is possible, after you have made a series of studies of this type, to use the comparison of these totals to balance-sheet data in order to test the reasonableness of these totals, but on a "one-shot" operation such as this series of analyses, no such tests can be made. The best method of testing the reasonableness of such studies is to do the high-to-low sequence sorting and check the high-value items from each sort against your detail records. If a mistake was made in drawing off the data at the time of the original punching, it is almost bound to show up in one of these sorts. Of course, if you miss an item completely, you're pretty much out of luck, unless you make a part number to part number match against some other existing punched card record. Now, any duplicated values in annual usage and inventory commitment will be carried over into either the shortage or excess columns, since these latter figures are determined from the former. Therefore, the ratio of these totals to each other can be used to establish the percentage of value that should be paid for the inventory. The determination of effective inventory commitment must also be made as we did in a previous analysis. In this case the effective commitment figures are:

Purchase	$ 65,000
Make	155,000
Total	$220,000

(These figures are obtained from Annual usage — Shortage, or from Inventory commitment — Excess.)

With an effective inventory commitment of $220,000 and an excess of $30,000, the ratio of "good" to "bad" inventory commitment is 7⅓ to 1, or I could state that the total commitment is 86.37 percent useful in the first year.

Seller: Does that mean you think you should pay about 86 cents on the dollar for the inventory?

Buyer: Yes. In this case I think this figure gives a pretty accurate description of what the inventory is worth to a prospective buyer, such as myself. Based on your original valuation of $160,000 for the total inventory, my method would produce a purchase price of $138,192 (160,000 × 86.37%). From this point I can only negotiate downward. The excess which brings the price down is the excess over a full year's usage, and I'm not at all certain that I want to pay 100 cents on the dollar for that portion of the inventory which will lie dormant for 8 or 10 months before it will be used. Before we get into that, however, I want to point out why I had this last study broken down between "purchased" and "made" items. These figures will be highly useful to me in determining cash requirements. Also, at this stage I am able to give both purchasing and manufacturing department a list of the items that I expect to order during the remainder of the year. Each list can be high-to-low sequenced to give the items their proper priority. This will enable the purchasing department to shop for prices and other sources, and the manufacturing department to look for cheaper methods. In both cases these departments will have a little time to perform such functions and do not have to wait for an order, which would mean operating on a "crash" basis.

* * *

Thus concludes this fictional drama. It is relatively unimportant whether the sale takes place or what price the buyer and seller establish. What is important is that, by looking at an inventory from the viewpoint of a prospective purchaser, the company executive who is charged with the responsibility of measuring the effectiveness of the inventory policy can get a better picture and produce more meaningful reports. It is not necessary that the procedure follow the lines of the example given here. Once the analysis is approached from the standpoint of a prospective purchaser, the techniques of measurement and control which have been described can be altered to conform to the data and details of any inventory. The fact that an inventory is kept on hand-posted ledger cards or in electronic or magnetic storage is not significant to the tests shown here. It may be highly significant in so far as the availability of data is concerned, but the techniques of measurement, selection, identification, and classifying according to priority are applicable to any inventory, and can be applied in as many ways as the imagination of the inventory manager can conceive.

Plus Factors in Pension Costs

by PAUL W. DEMAREST

THIS STUDY is directed at the considerable number of companies who do not have an employee pension plan. It is also a re-examination of existing retirement programs.

From ball players to coal miners there are a total of some eighteen million employed Americans who can now look forward to retirement and old age with some degree of equanimity. This large number of private pension plan participants represents over one-fourth of our entire working force. A much larger proportion of our workers come under public pensions such as Social Security, veterans, police and teacher retirement plans. It is apparent that most of us are imbued with the idea that a pension plan is a fine thing. Those firms which have not to date established a retirement program are under constantly increasing pressure to change their ways. However, if the accountant is unencumbered by political or union pressure, he can present a pretty fair case against his firm jumping into one of these expensive "pay for no work" plans. The problems of recording pension costs have already been ably covered by Roy Matthews in his article.[1]

Effect of Pensions on the National Economy

For the past two decades public and private pension plans have been the fastest growing segment of our rapidly expanding nonworking income. The following table shows the picture:

Type of nonworking income	*1940 Payments*	*1959 Payments*
Public pension plans	$ 2.1 billion	$19.2 billion
Private pension plans	0.1 billion	1.2 billion
Insurance, rent, dividends	11.8 billion	36.4 billion
Total nonworking income	$14.0 billion	$56.8 billion

[1] "Accounting for Pension Costs," Roy M. Matthews, Jr., *N.A.A. Bulletin*, August, 1960.

PAUL W. DEMAREST, Omaha Chapter (Chicago, 1949), is Divisional Controller of Independent Metal Products, Division of Fruehauf Trailer Company, Omaha, Nebraska. A graduate of Rensselaer Polytechnic Institute, Troy, New York, he received a B. S. degree in Business Administration. For the past 21 years he has been actively engaged in all phases of industrial accounting. Mr. Demarest is a previous contributor to the *Bulletin*.

Pension payments have increased nine times in these twenty years, while the old standbys of rent, insurance and similar types of income have risen to an amount only three times as large. Of even greater import is the number of persons receiving pension payments. The 1.2 billion dollars of payments in 1959 went to only 1,300,000 persons. The potential increase in the amount of these payments is tremendous when you consider the 18 million people now covered.

Accompanying this tremendous growth in pension plan payments and investments, there has been a marked increase in the number of ablebodied Americans not working. Social Security and private retirement plans are geared to the "normal" retirement age of 65. The number of unemployed but physically sound citizens has risen from 2,700,000 in 1949 to 5,500,000 in 1959. Since most of these are over 65, this trend is the direct result of public and private pension plans which have in effect forced or bribed able workers to quit. Here is a big minus of retirement plans, not recognized when such systems were introduced. As our longevity increases, this problem will be further aggravated. By encouraging or insisting on retirement at 65, industry is really paying twice for the same work; to the young people hired as replacements and to retired but able employees. In addition, there is growing pressure by the public on politicians and business managers to lower the retirement or pension age eligibility.

The Purposes of Pensions

What is on the plus side of the pension ledger? Old-age income is the primary benefit of Social Security and private pensions. Social security (with employers and employees both contributing) is a sort of legalized long-range compulsory savings plan. Private plans, where the employee as well as the company contributes, are similar long-range savings plans on a voluntary basis. The real purpose of a pension plan as a supplement to social security is to reduce turnover. Pensions also enable companies to eliminate without criticism their aged, overpaid employees in favor of younger, lower paid workers. The employee may experience tax savings through the deferred income angle of retirement pay. To cushion the shock of severance, pensions provide what their name implies—security. Pension contributions by corporations may be made at half price, due to tax savings. Death benefits, inherent in most plans, aid the families of deceased employees. These plans are designed to attract better employees and to increase the efficiency of those hired. Pension trust income is tax exempt if the plan qualifies under tax regulations. These are the stated benefits of pension plan programs. Each of them is a sort of long-range savings plan for old age at reasonable cost.

Unions and Pensions

At this point we have shown that the undesirable aspect of pensions in forcing the retirement of able workers over 65 is offset to some extent by savings benefits for the aged. A more recent unfavorable trend is the effect that unions have had on pensions. In 1949 the U. S. Supreme Court sustained a ruling that pension plans are properly a part of collective bargaining. Since that date the unions have jumped into the fray in earnest. Unions set up pension plans of their own which reputedly became huge slush funds not under the direct control of the members. However, in August 1958, a law was passed requiring the officials of all private pension plans, including both industry and labor, to submit to the U.S. Department of Labor annual financial statements which would be available to the participants. Unions have really altered the intent of pensions by their demands for changes in the voluntary conventional-type plan adopted by industry. Basically these conventional plans were based on pay rates and length of service. In place of them the unions developed what is known as pattern plans for a particular industry. In pattern plans the pensions are established at flat dollar amounts regardless of earnings, and the length of service eligibility requirements are reduced or eliminated. Such a trend, which makes pensions more of a pay increase than a savings program, would reduce the security incentive offered by the earlier conventional systems.

The unions have likewise succeeded in negotiating some plans at outlandish cost to the companies involved. One prominent leader of a national union recently stated that he doubted if his "boys" would strike for pensions higher than 70 percent! Another recently negotiated pension plan provides some hourly workers with payments that could reach an extremely high figure annually. The table shown below gives a clear picture of the unions' effect on pension costs.

	Monthly earnings		*Mo. ret. benefits-25 yrs.*		*Mo. benefits plus Soc. Sec.*	
Industry	*1950*	*1959*	*1950*	*1959*	*1950*	*1959*
Sheet Metal (Loc. 28 Brklyn)	$369	$542	$42	$ 60	$162	$234
General Motors	290	416	37	62	157	236
U. S. Steel	292	451	20	62	140	236
New York Milk Trade	338	450	50	125	170	299

In reviewing these figures some will say they do not appear unreasonable. But bear in mind that the increased cost of these payments was borne by the company since union negotiated plans are almost entirely non-contributory. This is a lot of money to be paid for a "nonworking" class.

Vested rights is another field to which unions are giving increased attention. Vested rights simply means partial or full pensions earned and in many cases payable before normal retiring age. Many union pattern pension plans today earn full benefits at age 40. Pattern plans also have provisions entitling the worker to carry his pension from one company to another where his union is represented. Such arrangements are hardly conducive to reducing turnover or providing incentives for continued services. These factors indicate that unions have reduced by bargaining many of the desirable effects of pensions. They have eliminated employee contributions and produced unnecessarily high benefits as well as advanced retirement of able workers.

The Power of Pension Funds

The vast sums available to the administrators of pension funds can have considerable effect on various financial institutions. Private pension funds recently had $29 billion dollars invested, mostly in bonds. If these funds were suddenly switched to mortgages, the effect would be significant on mortgage rates. Pension funds put into the hands of the administrator the power of attaining the control over a company through purchase of its stock. The fact that pension trustees have to date tended to diversify their investments does not eliminate this possibility. In other words, pension funds represent huge funds improper use of which could result in financial abuses or at least in unsound financial practices.

Pension Plan Operating Costs

Pension plans like other sound financial programs do not operate by themselves. If a trustee is appointed, which is desirable for most plans, there is an established fee. Plan operating costs vary from 5 percent to 8 percent of premiums, or contributions. The company payroll department has considerable record-keeping costs for a pension plan. Although most plans give the employer the right to terminate a pension plan at will, there is a fixed element of cost in such plans because of the ill will created if the plan is terminated. Due to changes in tax rates, employers can find themselves involved in plans more costly than originally intended. Pension plans raise the cost of commodities we buy. The selling price of hard and soft coal was raised 40 to 50 cents a ton to finance John L. Lewis's United Mineworkers pensions. Over one hundred thousand United Automobile Workers members will participate in company-financed pensions which pay $60 per month. Seventy-five thousand United Steel workers

will become eligible for company paid retirement income paying $60 per month. Twenty-five thousand members of the International Union of Electrical Workers have obtained from the companies in their field company-paid pensions of $50 to $60 a month. The companies in these industrial areas will certainly adjust their prices to cover this pension cost.

One further note on turnover. There is no substantial evidence to support the contention that turnover has actually been reduced by the installation of pension plans. As our economic activity changed in this century from an agrarian and small business world to major industrial groups, the economy has been more stabilized. A more stable economy reduces turnover with or without pensions.

Pension Plan Trends

Once a company is forced or consents to put a plan into effect, the cost and success of its operation can be controlled by careful selections of the plan's provision. We can profit immeasurably from the experience of firms with pension plans already in operation. The important questions to be considered in setting up a retirement plan are:

What employees are to be covered?
What are the eligibility requirements?
Will the employees contribute?
What are the retirement provisions?
Will disability retirement be provided?
What vesting requirements will be employed?
What will be the pension benefit amounts?
What method of funding will be used?

Employees to be covered. The number of employees to be covered in a company directly determines the cost of the plan. Hourly employees in a particular industry may have such a high turnover rate that it would make the plan inoperable. Turnover may also be high in a particular department or trade. Nothing in the tax laws prevents the selective approach as to who is to be included, except that discrimination in favor of top management groups is forbidden. Many firms might consider a trial run with salary employees to test a plan, with the intention of adding hourly workers later. However, once a company enters into a pension plan, it gives a signal to the union to bargain for all the workers to be included. For this reason most companies setting up pension plans now include all employees at the start. The services of a pension consultant are very useful in fitting the plan to a company's operation. Banks and insurance companies have wide experience in this area.

Eligibility requirements. Pattern plans negotiated by unions generally have no eligibility requirements and the day the employee is hired he becomes a pension plan participant. The majority of conventional plans have both age and service requirements. Such requirements obviously reduce pension costs. If the plan is sufficiently attractive to the worker, a service requirement of one to five years should reduce turnover. Plans with a minimum-age requirement, usually age 30, eliminate younger participants where turnover is always excessive and recording costs correspondingly high. The age requirement, however, reduces the interest-earning period and often necessitates a maximum-age limitation. To older workers seeking security, this would be an undesirable arrangement. For tax purposes a five-year waiting period is the usual time allowed. The trend has been to liberalize conventional plan eligibility requirements, possibly because of their minimal effect on turnover on newer employees.

Employee contributions. Employee contributions to pension plans represent a recent change in these programs. At first glance this practice would appear to reduce the employers' cost of pensions and severance pay allowances. But, with innumerable deductions already applied to the workers' wages, a compulsory pension plan deduction would increase his demands for higher wages. There is an extra cost to the employer in collecting these contributions. Since the employers' contributions to pensions are actually deferred wages, wage rates are ultimately adjusted to reflect such payments. In spite of all these objections, about half of conventional plans now in effect have required employee contributions. The trend away from employee contributions is reflected in plan amendments adopted in the last five years. This has been accomplished by a reduction of employee contribution rates. It is significant that, where employee contributions have been added to plans, the benefits have gone up. Our conclusion is that employee contributions do not reduce the employer's pension plan costs.

Retirement provisions. Liberalization of retirement provisions has been a consistent feature in recent years. Both conventional and pattern plans have in many cases added early retirement at the employee's option after specified years of service. Earlier retirement tends to increase the plan costs. The fact that Social Security retains 65 as the age for retirement requires adjustment of pension plan payment schedules with retirement before age 65. If all other conditions were eliminated, the proper retirement age would be determined by the type of occupation. An airplane pilot should retire sooner than a bank clerk. In the case of a much-valued and able employee, it might be to the company's advantage to retain his services beyond the normal retirement age. These are the reasons for suggesting that retirement age should be flexible.

Disability retirement. Disability benefits are being liberalized or added by employers in recent years. Disability provisions could cover a particular job or any job. Quite frequently disability benefits are tied in with workmen compensation payments and social security benefits. The fact that disability benefits are being added or expanded at a consistent rate would indicate that the participants consider them valuable additions to a plan. In this case, the increased cost might well be supportable.

Vesting. Vesting is the right of an employee to collect his earned pension if he quits before normal retirement or through early retirement provisions in the plan. In some cases when an employee leaves before normal retirement, benefits are held until normal retirement age is attained. Since vested rights are being added or liberalized for existing plans, the cost has been increased. Without vested rights, the employers' contributions for the departed employee would revert to the benefit of the other participants and thus reduce the contribution rate.

Past service credits are a similar problem to vested rights. Past service, if granted in full, could make some plans very costly. The amount of past service credits must be carefully checked with the financial condition of the business. To older employees, past service credits are important. However, they need not be assumed in full; credits may also be amortized.

Amount of benefits. The amount of benefits in conventional plans is frequently geared to the employee's rate of compensation. This is intended to keep his pension in line with his standard of living. Minimum pensions are a form of controlling pension costs and are on the increase. To control costs many employers have also put into effect a maximum-pension allowance. Pattern plans usually have a flat dollar amount per year of service and to this extent have a fixed minimum and maximum cost. By deducting social security benefits from pension payments, the costs are reduced. All of these restrictive features have the effect of preventing exhorbitant pension costs. Maximum limitations for supervisory pensions are required for plans to qualify under tax regulations. A recent innovation is the adjustment of pension payments for the changes in a cost of living index.

Funding methods. The most popular of funding methods for pension plans is the pension trust. Here a bank acts as trustee for the pension contributions invested in a trust, and the plan is operated by an actuary selected by the company. Other pension plans are financed through group annuity contracts issued by the larger insurance companies, or deposit administration contracts with insurance companies where annuities are purchased when the employee retires.

Unfunded plans are seldom used because in these programs no funds are set aside in advance. Which type of plan is best depends primarily on the size of the firm involved. A system of individual policy (annuity) purchases is usually the best plan for a small concern. In selecting the method of pension funding it should be understood that these plans are enforceable contracts in which the employee can insist on compliance with its terms. Pension trustees have been known to abuse their powers. The employer cannot neglect a periodic scrutiny of the funding agent's activities. In the attempt to correlate pension benefits with the cost of living, some pension plans are funded with variable annuities. The theory is that stocks will rise or fall with living costs, and pension funds so invested can be tied to this trend. In such cases the pension benefits are usually partly fixed and partly variable. The variable annuity is a controversial scheme, opposed by some insurance companies but growing in influence. At any rate, a steady rise in the cost of living makes this plan attractive.

Conclusion

A hard look at pension pitfalls may be like a small voice lost in the growing thunder of pension plan acceptance. Union negotiated plans have tended to ignore sound fiscal practice. In this article the emphasis has been given to the huge employers' costs involved. Several ways of controlling pensions costs have also been suggested. Accountants should no longer treat pensions as employee fringe benefits. The word pension means payment and pension payments are nothing more than deferred wages. Once started, pension plans become a fixed obligation. If discontinued because of poor business conditions, the effect would be more harmful than if the plan had never been initiated. Pensions are a business liability even if confined to a footnote on the financial statement. Deferred profit sharing plans could well be a more satisfactory retirement plan procedure, thus eliminating the fixed-cost element inherent in pensions.

A System of Property Control

by DONALD P. DECK

DOES THE COMPANY spend large sums of money periodically to have its property, buildings and equipment appraised, so that insurance values may be determined? Are the company's records insufficient in their existing state to establish the amount of loss in case of fire or other disaster? Does the company put off bringing property records up to date, as something that will be done "as soon as we get time," with the result that it never gets done?

Almost all companies must answer "yes" to some or all of the above questions. A realistic look at the company's records will probably reveal that the property records are not up to date, that much equipment is not even listed, that the exact location is unknown or changed and that original costs are no longer available because original invoices and purchase orders are in retired or closed files or have been destroyed. If your company is one which has this type of problem, then it will be well worth the time to investigate how it may best be solved. The cost savings and advantages gained may be tremendous if an adequate solution can be found.

The recognition of such a problem in your company should trigger the gathering and analyzing of all the pertinent facts. The remedial action, of course, will be dictated by the amount and type of information desired. Each company has its own set of conditions and peculiar problems and there are as many right remedies as there are companies.

Let us see how Company A, a medium-sized corporation, remedied its problem with a specific property control system. While this system possibly does not give every answer that may be desirable, it is extremely flexible and, what is more important, it works.

This property control system is designed primarily to make available within a short time all the necessary information regarding cost, depreciation, location, quantity, book value, etc., for all company property, by piece, whether or not this property is being depreciated or has been expensed. A strong secondary result is the ability to maintain insurable value, by piece of equipment and in total for all equipment, on a current basis regardless of age and without the necessity of having an appraisal made. Emphasis is placed within the system on

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DONALD P. DECK, Paterson Chapter (Fort Wayne, 1956), is European Liaison Accountant stationed in Rome, Italy, with ITT Communication Systems, Inc., Paramus, N. J. His previous experience includes the positions of Internal Auditor and Manager of Cost Control as well as Chief Research and Development Accountant at Federal Division of ITT. Mr. Deck is a graduate of International College with a B. S. degree in Accounting.

maximum utilization of machine accounting techniques and reduction of manual computations and other manpower consuming functions.

How to Implement the System

In order for this system or any system to function properly, several basic controls must be instituted and these must be ironclad. These controls in themselves are simple, but the system allows no room for compromise of the basic rules. These rules are as follows:

1. A basic decision must be made on which items are to be included in the system, that is, machinery, equipment, desks, autos and trucks, and buildings would probably be included, whereas small items, such as wastebaskets, staplers and calendar pads probably would not. A code number is established for each type of equipment when the decision is made as to what items to include.

2. An agreement must be reached on how to identify the location of the property. This could be by plant, floor, department or any other appropriate method of segregation.

3. A definite control point must be established in the receiving area to assure that all items to be included in the system are properly identified by means of a property tag. These tags should be prenumbered, of a durable nature, and permanently attached to the item of property. The tag numbers, along with information as to the location to which item is sent, a description of the item, manufacturer's name, model number, serial number and purchase order number must be forwarded to the accounting department for further processing.

4. The processing of information supplied to the accounting from the receiving department must be timely and accurate. Information regarding cost of item and original invoice number must be included in the system. In addition, the computation affecting insurance value and depreciation must be computed and put into the system periodically.

5. Totals of depreciable items placed in the system must be reconciled and made to agree with the general books on a monthly basis.

6. A central clearing point must be established, and company property included in the system must be moved only by or through this facility. This control point will generate all information as to change of location of company property.

7. Periodically, but not less than once each two years, a physical inventory shall be taken of all company property. The results of this physical inventory, where applicable, must be utilized to update the system.

Functioning of the System

Now that we have established a group of ground rules needed to implement a system what type of system can best be utilized? The following is recommended from the standpoint of cost, maximum machine utilization and ease of access to information.

The machines required to operate the system consist of conventional tabulating equipment. Many medium-sized companies now have this type of equipment on their premises. If it is not available within the company, the work can be done at any Service Bureau, a number of which are established for these purposes, operating at a very small cost. This type of work is ideally suited for filling in the slack periods which may develop on equipment located on the company's premises.

The set of records consist of two standard 80-column tabulating cards which are generated for each piece of company-owned property. The following inputs are suggested for each of the two cards:

Card No. 1 — Locator Card		*Card No. 2 — Cost Card*	
Cols.		*Cols.*	
1- 4	Company tag number	1-33	Same as card no. 1
5- 7	Description code number	34	Card no. (2)
8-11	Gen. ledg. acct. or exp. acct. no.	35-39	Purchase order number
		40-45	Orig. inv. no. or voucher no.
12-14	Dept., plant or floor code	46-47	Month acquired
15-33	Property description	48-49	Year acquired
34	Card no. (1)	50-52	Depreciation rate
35-54	Supplier's name	53-59	Insurance value
55-60	Model number, if any	60-66	Cost value
61-73	Serial number, if any	67-73	Depreciation to date
74-80	Unused	74-80	Book value

Exhibit 1 displays layout, showing the various fields mentioned above. The following sources are utilized to "input" information into the above fields:

CARD NO. 1 — LOCATOR CARD

1. Company tag number from property control, card input form, generated by the receiving department.

2. Description code number same as above. A list of standard codes is maintained and supplied to the receiving department.

3. General ledger account number—from account coding on original invoice distribution block.

4. Property description—from property control, card input form, generated by receiving department.

EXHIBIT 1

DATA PROCESSING
Operation Instruction Sheet

REPORT TITLE	JOB NO.
COMPANY PROPERTY CONTROL	SHEET NO.
Multiple Layout Card Form	OPERATION CODE
PREPARED BY / DATE / ESTIMATED TIME	MACHINE CODE

LOCATER CARD — GREEN

TAG #	PROP TYPE CODE	GEN. LEDR. ACCT.	DEPT #	PROPERTY DESCRIPTION	PROPERTY DETAIL: MANUFACTURERS NAME	MODEL #	SERIAL #
1-4	5-7	8-11	12-14	15-33	35-54	55-60	61-72

COST CARD — YELLOW

COMMON FIELDS	PURCH ORDER NO.	VOUCHER NUMBER	DATE ACQR No	DATE ACQR Yr	DEPR RATE	COST INFORMATION: (1) INSURANCE VALUE	(2) COST VALUE	(3) DEPR. TO DATE	(2-3=4) BOOK VALUE
1-33	35-40	41-48	49-50	51-52	53-56	57-62	63-68	69-74	75-80

5. Card number inserted by keypunch operator.

6. Supplier's name—from property control card input form, generated by receiving department.

7. Model number, if any—same as 6.

8. Serial number, if any—same as 6.

CARD NO. 2 — COST CARD

1. Purchase order number—from property control card input form, generated by receiving department.

2. Invoice or voucher number—from cross reference on accounts payable copy of purchase order.

3. Date acquired, month and year—from original invoice.

4. Cost value—same as 3.

5. Depreciation to date—to be captured each year and updated at the end of the year based on age of item and method of depreciation. Composite percentages obtained are then multiplied by the cost base (4) by machine methods eliminating numerous clerical operations. This item must be reconciled in total to the depreciation accounts shown in the general ledger.

6. Book value is calculated automatically by machine by subtracting Field No. 5 from Field No. 4.

7. Insurance value is to be computed from percentages derived from tables on insurable value published by various insurance companies and associations. These percentages are then multiplied by the cost base (4) by machine method, again eliminating numerous clerical operations.

All information has now been placed in the proper fields in the punched cards.

How can these cards be sorted to obtain various types of information? A few examples of the many various ways are attached. These "runs" are explained below:

Run 1 (Exhibit 2). This run illustrates the sequence in which cards are listed to facilitate taking of physical inventories. By utilizing this type of run, physical inventories can be quickly taken. Tagged items can be checked off against the list, and low-level clerical effort can be utilized to do all detail work. This type of run should also be made quarterly to assure that no item that has been tagged has not been included in the system.

Run 2 (Exhibit 3). This run illustrates the ability to determine the amount of company property and equipment utilized by each department within the

EXHIBIT 2

Run No. 1-For Physical Inventory

Tag #	Code #	Acct. #	Dept.	Description	Model No.	Serial No.	Purc. Ord. #	Vouch. No.	Date Acq'd	Depr. %	Insur. Value	Cost Value	Depr.	Book Value
1000	021	1612	800	Desk, Standard	1702		7112	4-33	03 55	631	10679	9450	5963	3487
1001	021	1612	800	Desk, Standard	1702		7112	4-33	03 55	631	10679	9450	5963	3487
1002	021	1612	800	Desk, Standard	1702		10041	4-33	09 56	539	9923	9450	5094	4356
1003	021	1612	800	Desk, Standard	1702		10041	4-33	09 56	539	9923	9450	5094	4356
2018	171	1610	700	Zerox vapor fuser		61U70046	13116	11-179	08 57	712	12348	12473	8881	3592
2020	201	1610	700	Transcription mach.		240788	13916	8-57	11 57	712	19774	19974	14221	5753
2022	202	1610	700	Dictating machine		241347	12313	8-57	12 56	827	18848	17950	14845	3105
2023	153	1610	700	R/R adding mach.	31002	3N1536665	13911	11-80	04 58	520	26041	26304	13678	12626
2025	202	1610	700	Dictating machine		245225	14000	9-135	11 57	712	17415	17591	12525	5066
											4788787	4759422	2370387	2206583

EXHIBIT 3

Run No. 2 - By Departments

Tag #	Code #	Acct. #	Dept.	Description	Model No.	Serial No.	Purc. Ord. #	Vouch No.	Date Acq'd.	Depr. %	Insur. Value	Cost Value	Deprec.	Book Value
1665	126	1610	301	IBM Typewriter 13		1169105	12237	9-30	12 56	827	44856	42720	35329	7391
											44856	42720	35329	7391
1094	076	1612	301	Table 63 x 26	1717		12371	7-34	04 57	424	7078	7150	3032	4115
1103	040	1612	301	File Cabinet 5 Dwr.	305		7101	4-33	04 56	539	9125	8690	4684	4006
1127	111	1612	301	Bookcase	9x13		11977	12-257	03 56	539	2054	1956	1054	902
1901	097	9999	800	Coatrack 12 Posit.	3U4		14139	2-131	10 58		3564	3600		
1943	012	9999	800	Drafting Stools	668T		13921	7-238	01 59		2700	2700		
											38717	38364		
											512769	502333	267617	196352
											4788787	4759422	2370887	2208583

EXHIBIT 4

Run No 3 - By Acquisition Date

Tag #	Code #	Acct. #	Dept.	Description	Model No.	Serial No.	Purch. Order #	Vouch No.	Date Acq'd.	Depr. %	Insur. Value	Cost Value	Deprec.	Book Value
1918	165	1610	700	Gest Mimo-graph w/c			7075	5-15	03 55	896	76275	67500	60480	7020
1663	126	1610	800	IBM Typewriter 13			7071	7-280	03 55	896	55738	49326	44196	5130
											132013	116826	104676	12150
1573	051	9999	800	Storage Cabinet			13987	12-47	04 59		4646	4646		
1691	114	9999	800	Tiffany Stands			14397	7-374	04 59		2375	2375		
1943	012	9999	800	Drafting Stools			13921	7-238	01 59		2700	2700		
											66946	66946		
											1503818	1505818	275251	1163621
											4788787	4759422	2370587	2208583

EXHIBIT 5

Run No. 4-By Items of Equipment

Tag #	Code #	Acct. #	Dept.	Description	Model No.	Serial No.	Purch. Ord. #	Vouch. No.	Date Acq'd	Depr. %	Insur. Value	Cost Value	Depr.	Book Value	
1162	004	1612	400	Chair Revolving			9334	4-33	08 55	631	4012	3550	2240	1310	1
											4012	3550	2240	1310	
1166	004	1612	400	Chair Revolving			10041	4-33	03 56	539	3518	3550	1913	1637	
1170	004	1612	400	Chair Revolving			10367	4-33	09 56	539	3518	3550	1913	1637	
1215	236	9999	800	Floor Lamps			12241	11-304	12 56		2869	2733			
											2869	2733			1
											2869	2733			1
											4788787	4759422	2370887	2208583	173

company. It is segmented within departments to show totals within each general ledger account. This run is utilized in budget analysis, requests for new appropriations and the allocation of depreciation. It also points out how well company property is being utilized.

Run 3 (Exhibit 4). This run enables management to analyze property acquisitions by year. It is useful in establishing trends and planning for future years and for assuring that totals by year as shown in the general books agree with the totals shown in this system.

Run 4 (Exhibit 5). This run illustrates the ability to determine on a moment's notice the number of items of each type of equipment currently in the company's possession. The information is valuable in determining the average cost of equipment per employee or can be used by the purchasing department to analyze prices paid for items purchased in the past.

In all the above runs, it will be noticed that totals are carried for cost values, depreciation to date (regardless of year or acquisition) and the remaining book value.

Particular attention should be given to the insurable value of the company property as shown in these runs. Too frequently companies are unable to adequately evaluate their company property for insurance purposes. Since the insurable value of company property is neither the original cost of the equipment nor the remaining book value, if any, the necessity for establishing an equitable insurance base becomes a difficult but necessary problem for most companies. For insurance purposes we are concerned only with replacement and insurable values. Replacement value is the cost to replace buildings or machinery with like kind and quality at the present time. Insurable value is replacement value less depreciation due to wear and tear. To determine insurable value it is first necessary to determine replacement value. In many companies the only accurate way to do this is by field survey by a competent engineer of an appraisal firm. Furthermore, when the replacement value is determined, the amount of depreciation must then be determined, and this again normally requires a field inspection. The cost of having this inspection made is normally quite high. We believe that by properly utilizing the system of property control being described and by establishing accurate and reliable cost values, we may be able to offset all or most of the cost normally expended for such a survey. Future surveys can certainly be limited to spot checking records and rates, and certification of values.

Here is how this is accomplished:

1. We have, by use of the system, established accurate original cost

values for each piece of equipment. Through the use of tables published annually by various insurance companies and associations, we can determine the amount of replacement values by merely multiplying the original cost value times the percentage presented in these tables.

2. After establishing the replacement value, we can determine depreciation applicable to the property on the basis of tables published by the same organization. Having established these two percentages, we can now properly determine the insurable value of the company property.

3. By using the percentages obtained in 1 and 2 above, we can establish a composite percentage for each year in which property has been acquired.

4. When these composite yearly percentages have been properly inserted, multiplications are done by machine, eliminating all clerical effort.

5. Since the insurable value of the property changes each year, the latest tables must be utilized on a yearly basis in order to update the runs.

Now we have a system!

How do we install the system?

Installation of the System

The installation of the system in a newly organized company is fairly simple and presents no particular problems, as all purchases are prospective. However, when we attempt to place this system in an old-established company which has in the past purchased many of the types of equipment in which we are interested, the situation confronting us is radically different. For instance, in many cases the original cost of the building or equipment will be no longer available. The date of acquisition may not be readily determinable. Original invoices may have become lost or have been destroyed. Equipment is not tagged and the location and quantities on hand are not known. How can the system be applied to companies with the above problems?

The steps to be taken are as follows:

1. Install the complete system at a point in time from which all future acquisitions will be handled as described. This will enable all equipment from this point forward to be adequately accounted for.

2. Depending upon the amount and age of buildings and equipment purchased in the past, one of two alternate methods of placing these items in the system can be utilized. These are:

a. The facts necessary to develop the information required can be reconstructed out of old records and files. If the company is long established, this will quite likely be impossible, at least in part.

b. The company can have an appraisal made of all property as of the established cut-off date and, using this appraisal, can develop the information necessary to control all old equipment.

Since it is likely that the company will have an appraisal made for insurance or other purposes within the near future, it would be well to utilize this appraisal for placing facts on old equipment in the system. While this method is costly, it should be remembered that, once the base is established for these old items of equipment and they are placed in the system, any future appraisal would be greatly reduced in scope and cost.

Because the system is built around a group of standards, it is necessary only to extend the system to adapt it to a multi-plant or multi-division organization. For instance, the standard listing of items and coding for items can be used in any number of locations. The method of establishing the system in all plants of a large company will take careful planning and organization. First of all, it would seem logical to establish a central staff group responsible for initiating the system within each of the various plants or divisions. This group could be assembled and trained at the central office, with the necessary ground rules and standards that will cover all the various plants. These rules must be established at the central office and should be firm, with just the right amount of flexibility to encompass the varying situations that will be found when installing the system in the plants.

This central group, trained and equipped with the basic ground rules and standards, will then proceed to install the system in the plants or divisions. It would be well to start the installation of the system at one or more of the smaller plants or divisions and thus establish the training ground where also the standards and rules can be checked and revised if necessary. This will also help the central staff group develop the skill and familiarize themselves with the operating problems. With this experience "under the belt" the installation of the system in the larger plants can be approached with confidence. It would undoubtedly be necessary for each of the local plants or divisions to contribute some clerical help to supplement the efforts of the central group when this group is installing the system at the local plant. This will serve the dual purpose of training the local personnel in the intricacies of the system while holding down the size of the central staff group. After the system is installed and in operation, it will be maintained at the local level.

A master deck of punched cards, containing the information on items of property at each of the local offices, will be maintained in the central office. Local management will be responsible for maintaining local decks and for transmitting the same information to the central office for updating the master deck. The advantages of having a master deck at the central office can readily be seen. Some of the advantages are noted below:

1. In case of a loss or disaster at a local office, in which the local property records are destroyed, duplicate records are available at the central office.
2. If insurance for the entire company is written through the central office, this file provides a source of instant information which is always up to date, thus eliminating the necessity for the ever-present requests for information which now flow to the local office.
3. Information on *all* company owned property is at management's fingertips, including location and quality. The benefits derived from this information are many; for example, costs associated with transfers of property between plants can be easily established, high priority test equipment can be loaned between companies rather than making new purchases, and measurement of utilization of company property by plant or division can be made more easily when needed. These and many more valuable items of information are available.
4. Accurate insurance bases can be established without requesting additional information from the various local offices or having expensive appraisals made.
5. The original cost, depreciation to date, and book value of each piece of company property is instantly available on a uniform basis.
6. Purchasing practices relating to company property can be analyzed and central or combined purchasing may result, in order to effect cost savings.
7. This information can be analyzed to determine the feasibility of entering into some of the leasing arrangements now being offered as opposed to continued purchasing.

While the above points do not nearly include the wide range of information that is available from this system, they do indicate the areas in which worthwhile cost savings can be realized by any company, large or small.

All companies spend a substantial amount of time and money on controlling and analyzing their raw material inventories, work-in-process inventories and finished goods. Annual inventories are the rule rather than the exception, and perpetual inventories have been a "must" for many years. Management must now turn to other areas to achieve maximum savings and maximum profits. Company property is a fertile area, and we believe this system may answer the problem and result in substantial savings.

Take All Discounts — For Profit

by DONALD D. KIPP*

IN THE OCTOBER 1960 issue of the *N.A.A. Bulletin,* M. D. Winter, writing under the title of "A Closer Look at Cash Discounts," sets forth a group of rules which he considers usable for most companies in determining whether or not the discount offered is really worth taking. Mr. Winter suggests not taking smaller discounts (those under a dollar). However, I believe that all discounts should be taken. The amount of time necessary to type checks for different amounts is negligible. The same holds true regarding filing time of these various discounted invoices.

We handle the records of many companies, both large and small, and it is interesting to note that, in almost all instances, all discounts are taken. Four out of five of these discounts amount to less than one dollar. I readily concede that to process invoices in large companies costs a good deal but this cost may be allowed because of the cash savings involved. By taking cash discounts, a company is, in effect, investing its funds at an extraordinarily high interest rate, one it could not get any other way. Therefore, I disagree with Mr. Winter on the main point. Let us look at the problem mathematically for a minute.

For example 2 percent does not sound like very much, but, whether the phrase on the invoice is "2%, 10 days, net 30 days" or "2% 10th prox., net 30 prox.," or whatever else it may be, it figures out to $\frac{1}{10}$th of 1 percent per day. That is an interest rate of 36.5 percent per annum. By taking all of these discounts, companies can put themselves in a very advantageous position when their competitors, either through inability or lack of financial understanding, cannot discount their suppliers' bills. This gives them a cost gain, to improve their profit results or to meet price competition, or both.

If a company becomes temporarily pressed for cash to meet its suppliers' bills on a discount basis, its accountant should encourage it to borrow. There certainly is a definite advantage in borrowing money at 6 percent per annum to earn 36 percent per annum. Bankers tend to look with favor upon this type of loan as evidence of financial sagacity.

In some businesses, the cash discount represents all and even more than the merchant's entire profit. This is true in many types of jobbers. In these days of fierce competition, it seems to me that it is a matter of "life or death" to earn these cash discounts.

The chart below, while based on a substantial item, shows why it pays to borrow money to pay bills within the discount period. Figures are based on an arbitrary bill of $10,000 with the normal 10-day 2-percent discount.

DISCOUNT PROFITS

Discount	$200.00	$200.00	$200.00	$200.00	$200.00
Cost of borrowing	21.92 (4%)	24.66 (4½%)	27.40 (5%)	30.14 (5½%)	32.88 (6%)
Net discount savings	178.08	175.34	172.60	169.86	167.12

* Owner of D. D. Kipp and Associates, Aurora, Illinois.

A Method of Determining Return on Investment

by ROBERT A. LINEBERGER

THE ACCOUNTING PROFESSION is constantly concerned with the problem of measuring the effectiveness of business operations so that intelligent management decisions can be made. There are many analytical devices available to the businessman, such as current profit rate, variation from standard, budget comparisons, inventory turnover, etc., all useful but limited in their projection of the business picture.

Under our system of private enterprise, the one single objective of employing capital and conducting business operations is to yield the highest possible return (i.e., earnings) on the investment of funds. Therefore, the measurement of return on investment is the highest-order appraisal that can be applied to a business. It can be used not only in measuring operations but also as a useful analytical tool in evaluating choices when making decisions.

There are many possible refinements of the return-on-investment method, but the approach to be illustrated here is based on data normally found in the financial statements of any business concern. Thus, it has the advantages of relative simplicity of method and of permitting those using it to work with information generally familiar to nonfinancial management personnel.

Determining Investment and Earnings

Investment may be defined as the sum of the assets less the short-term liabilities. This definition of investment treats long-term debt in the same manner as owner's equity (i.e., as a source of funds). This is done primarily because the principal purpose is to determine how effectively total investment is utilized in the business, irrespective of whether the source of the investment is common stock or long-term debt financing.

Following is a typical listing of the items that go to make up the average investment of the enterprise:

AVERAGE-INVESTMENT BALANCE SHEET

Cash and government securities	$ 3,000

ROBERT A. LINEBERGER, Long Beach Chapter (Los Angeles, 1949), is Assistant Controller of Beckman Instruments, Inc., Fullerton, California. He has taught evening classes in Accounting at Long Beach City College. Mr. Lineberger is a graduate of Lake Forest College, Lake Forest, Illinois.

Receivables (notes, accounts, etc.)	10,000
Inventories	13,000
Prepaid expenses	260
Plant and equipment (@ 50% of original expenditure)	4,000
Land	100
Intangibles (patents, goodwill, etc., @ 50% of original expenditures)	500
Subtotal	$30,860
less:	
Payables and accruals	$ 5,000
Income tax accrual	1,860
Total	$24,000

Several of the items in the average-investment balance sheet are treated somewhat differently from the treatment given them on a typical balance sheet: the investment in depreciating or depleting assets, such as plant and equipment or intangibles, is stated at one-half of the original expenditure. This seems to be preferable to the several alternatives which are available, such as net asset value (i.e., after deduction of depreciation or depletion reserves) or original expenditure value. The use of net asset value would cause a continuously changing investment in each succeeding period even when other factors of investment and earnings are constant. This problem could be avoided by stating the investment at the original expenditure amount. However, since the average net investment in depleting assets found on many balance sheets will approximate 50 percent of the original expenditure, it seems desirable to state our investment at its average of one-half of the original expenditure. Presently allowed methods of accelerated depreciation may tend to lower the average investment below 50 percent; but this has not seemed to be of sufficient magnitude to warrant consideration.

Earnings can be defined as the amount of revenues resulting from operations, that remains after provision for all costs incurred, including the cost of depleting or depreciating assets. Earnings may be considered before or after income tax. If taken after income tax, then the rate of earnings will be affected by changes in the income tax rate. Since a business can do little to maintain its characteristic after-tax earnings when subjected to changes in the income tax rate, it is preferable to use earnings before income taxes in measuring the effectiveness of investment. Nonrecurring gains or losses should be excluded from earnings if arising from events outside the normal purpose of the enterprise, such as a random gain or loss from sale of fixed assets of a manufacturing concern, since this is outside the basic purpose of a manufacturing business.

Return on Investment

Using the previous illustration of investment and assuming earnings of $7,150 we find the rate of return on average investment for this particular enterprise to be:

$$\frac{\text{Normal pre-tax earnings} \quad \$\ 7,150}{\text{Average investment} \quad \$24,000} \times 100 = 30\%$$

Determination of the rate of return is in itself of no value unless some criteria or standards are established. One basis for determining such a standard is to examine the rate of return achieved in the past, a rate presumably satisfactory to persons investing in the business.

If a company had a continuing ability in past operations to achieve a 30-percent return on average investment, a standard for return on investment for current operations might be established at 35 percent. In order to improve over-all investment performance, a standard for proposed new or added investment could be established at 40 percent.

A useful relationship exhibited by the principal factors affecting return on investment is demonstrated in the equation:

$$\text{Capital turnover} \times \text{Percentage of pre-tax profits} = \text{Percentage of return on average investment}$$

where $\text{Capital turnover} = \dfrac{\text{Sales}}{\text{Average investment}}$ and

$$\text{Percentage of pre-tax profit} = \frac{\text{Pre-tax profit}}{\text{Sales}} \times 100$$

Assuming total sales of $55,000, capital turnover is computed as 2.3 ($55,000 ÷ $24,000) and the percentage of the pre-tax profit is 13 (100 × $7,150 ÷ $55,000). The rate of return on average investment is 2.3 × 13% = 30%. This equation demonstrates that a business with low capital turnover requires a relatively high percent of pre-tax profit (as is perhaps typical in the steel industry), in order to earn an adequate return on investment. On the other hand, a business with a low pre-tax profit percentage on sales (such as 4 percent or less, as found in supermarket operations) can earn a similar return on investment only if a higher capital turnover is achieved (7½ times in the case of 4 percent pre-tax profit on sales).

Application of Method to Measurement of Operations

The tool of return on investment can readily be applied to measurement of operational performance for an entire company, for operating divisions that represent profit centers, and for product lines.

In the case of the entire company the data found on the regular monthly balance sheet is modified to show depleting assets at their average half-life investment value to obtain the total average investment. Pre-tax earnings for the month, as shown on the profit and loss statement, must be annualized in order to obtain a yearly rate of earnings. Division of the annualized rate of earnings by the average investment yields the rate of return on investment.

A similar appraisal of actual performance can also be made of competitive companies, using information from published financial statements. This information is usually available for a fiscal-year period and can serve as a useful comparison of relative performance.

Where a business is organized with operating divisions as profit-making centers, return on investment is an excellent measure of comparative performance of divisions. It is generally desirable to have the sum of all the individual divisional investments and pre-tax earnings added up to the same total that is determined for the company as a whole. This avoids the problem of having one standard rate of return for the entire company and another for individual divisions, which would be necessary if the parts did not add up to the whole. Accomplishment of this objective requires that all investments carried on the corporate books and not shown on divisional balance sheets (if they are prepared) must be pro-rated to divisions on an equitable basis. In addition, all costs incurred by the corporate group that are chargeable to operations of the period should be equitably allocated to divisions.

With this method, the next logical step is to establish budgetary plans for return-on-investment performance for divisions and the entire company, for each month and cumulatively for the year. Monthly statements of profit and loss are a normal part of budgetary procedure. It is also necessary to establish a budget for the average-investment balance sheet. Some divisions, and possibly the company as a whole, may not be able in any given period to achieve the standard established as a goal for operational performance, while some divisions may be able to exceed this standard. The monthly budget for return on investment serves as a measure of actual performance against currently approved plans that may differ from the established standard for rate of return on investment. Accordingly, a current budget for planned return on investment from operations is useful for the company and divisions.

Return on investment for product lines can also be determined. It is necessary to take the total investment of the division and allocate each element of investment on an equitable basis to the various product lines. In addition, pre-tax profit must be determined for each product line. It is apparent that the smaller the unit for which return on investment is being determined (i.e.,

company, division, product line, etc.) the more difficult it becomes to obtain a direct identification of various items of investment or cost with the unit. However, application of techniques of proration and allocation, so highly developed in the establishment of departmental overhead expense rates, will yield results in identifying investment applicable to product lines. This type of analysis will disclose product lines which are below average in rate of return on investment even though the percentage of profit on sales has always appeared to be acceptable.

Application of Method to Investment Decision—Cost Reduction

The basic method developed here can be applied to appraise individual decisions concerning the desirability of investing in additional capital equipment in order to obtain cost reduction.

Whenever any added investment is proposed, the marginal earning and investment effects of the proposal should be considered as it relates to other courses of action. At least one alternative to a proposed action will always exist, even if it is to do nothing. Costs, earnings or investments of the past or future that are not affected by a proposed investment should be excluded from consideration in determining the marginal return on investment resulting from any proposed investment.

Where investments are undertaken for the particular purpose of cost reduction, the marginal savings that result are just as much earnings as the earnings that may result from added sales volume. Earnings resulting from investments for cost reduction are generally of a higher order in terms of probability than investments which depend upon earnings from added sales volume. If an added sales volume type of investment requires a 10-percent increase in volume in order to obtain a satisfactory return on investment, a subsequent 10-percent decline in volume will totally eliminate the added earnings upon which the investment was predicated. A similar 10-percent decline in volume will only remove one-tenth of the earnings of an investment for cost reduction purposes. In addition to this protection-of-earnings aspect, the facts supporting the probability of achieving a cost reduction are often more reliable than those supporting an increase in sales volume.

As an illustration of a return-on-investment appraisal of an investment for cost reduction, assume that final packaging of a product is currently done by hand with a three-man crew which regularly works one full shift every day on this operation. It is proposed to invest $40,000 for an automatic packaging machine which eliminates two persons from the crew. The machine will add

costs of about $1,500 per year for maintenance, taxes and insurance, and can be expected to be useful for ten years. Determination of return on investment follows:

MARGINAL EARNINGS PER YEAR

Annual gross earnings (savings):	
Crew reduction of 2 men × 2,080 hrs/yr × $2.50 hr	$10,400
Marginal indirect labor expenses @25% (vacation, holiday pay, SS taxes, etc.)	2,600
Total	$13,000
less: Annual added costs to obtain gross savings:	
Added maintenance, taxes, insurance of machine	$ 1,500
Depreciation of machine $40,000/10 yrs	4,000
Total	$ 5,500
Marginal net earnings before taxes	$ 7,500

MARGINAL INVESTMENT

Average investment in machine $\frac{\$40,000}{2}$	$20,000
less: Average income tax accrual on added earnings (26% of earnings)	1,950
Total	$18,050

RETURN ON INVESTMENT

$$\frac{\text{Marginal earnings } \$7{,}500}{\text{Average investment } \$18{,}050} \times 100 = 42\%$$

Since the 42-percent marginal rate of return on investment exceeds the company standard for added investments of 40 percent, the expenditure of $40,000 for a new packaging machine is financially desirable.

In making this evaluation of marginal return on investment, consideration has been given to only those items of earnings and average investment that are affected by the proposed action. It can be shown that the average income tax accrued for a fiscal period is slightly in excess of 30 percent of the total earnings of the period, due to the timing of such payments to the Government. However, an average of one half of the total income tax rate of 52 percent is used (i.e., 26 percent of earnings) in order to be consistent with the methods adopted for averaging investment in depreciable assets at one half of the total value expended. The difference involved does not significantly change the results.

Application to Investment Decision—Expansion of Sales Volume

As noted previously, investments for the purpose of gaining added earnings from added sales volume are often in the category of higher risk than those made for cost reduction. Nevertheless, since they are probably more frequently encountered, they require careful appraisal.

As an example, a proposal is made to lease a warehouse in the Chicago marketing area and to invest approximately $100,000 in added warehouse inventory in order to give quick customer service. The expected annual operating costs of the warehouse are $15,000. Market surveys show that this action can reasonably add $500,000 to our present annual sales volume. Determination of return on investment follows:

MARGINAL EARNINGS PER YEAR

Annual gross savings	
Added sales volume	$500,000
less: Total cost of sales	400,000
Total	$100,000
less: Annual added costs to obtain gross earnings (added warehouse operating costs)	$ 15,000
Marginal net earnings before taxes	$ 85,000

MARGINAL INVESTMENT

Cash	$ 20,000
Accounts receivable	60,000
Inventory — Chicago warehouse	100,000
— Factory work-in-process necessary to support added sales	50,000
Subtotal	$230,000
less: Payables and accruals	$ 20,000
Income tax accrual (26% of earnings)	22,000
Total	$188,000

RETURN ON INVESTMENT

$$\frac{\text{Marginal earnings } \$\ 85{,}000}{\text{Average investment } \$188{,}000} \times 100 = 45\%$$

The return on the whole investment which would be required by a decision to stock inventory in a Chicago warehouse amounts to 45 percent. Since this exceeds the 40-percent demanded rate of return for new investment, the proposed action is financially desirable.

Application to Investment Decision—Engineering Product Development

Expenditures of major funds for product research and development are investments subject to return-on-investment appraisal, even though tax laws permit their write-off as costs of the current period. Money invested in engineering for developing a salable product should be expected to produce sufficient revenue in succeeding periods to cover all costs, including recovery of the initial investment in engineering, plus sufficient earnings to warrant the investment.

The principal difference between an investment which can be written off in the first year for income tax purposes and one for which the investment is written off evenly over its full life is the different time rate at which funds are received by the business. In both cases, however, the total funds returned to the business at the conclusion of the life of the investment will be the same. Nevertheless, it is true that funds returned sooner are preferable to the same amount of funds obtained later.

The return-on-average-investment method developed thus far deals with average, before-tax earnings and therefore is not readily adaptable to measuring after-tax earnings or cash flows that vary due to fluctuations in income tax rates. The discounted-cash-flow method of determining return on investment does recognize time differences in the receipt of cash and can be used to compare the rate of return on an investment that can be expensed with that of an investment which is evenly amortized.

This comparison shows that the rate of return on an expensed investment is approximately one-half greater than the rate of return when the same investment is evenly amortized. In other words, if an evenly amortized investment shows a discounted-cash-flow rate of return of 30 percent, the same project will show a rate of return of about 45 percent when the investment is written off in the first year.

The same effect of increasing the earning rate of an expensed investment by one half can be achieved under the average-investment method developed here if the statement of average investment in an amortizable asset is changed from 50 percent to 35 percent of the original investment.

This method of handling an expensed investment is used in the case of investment in engineering product development. As an illustration let us assume that it is proposed to invest $200,000 in engineering and developing a new product. Market survey shows that the product can create additional sales for the company averaging $1,000,000 per year for the five years of expected product life. The probable unit selling price is known to be $1,000

and the engineers are able to state that it is reasonable to believe that the product can be produced with a direct material and labor content of $500 per unit when manufactured in lots of 100 or more. In addition to the expensed investment in engineering development of $200,000, there will be an expensed investment in start-up costs in the manufacturing and selling groups for initial heavy production scrap, production and sales training, and "kick-off" advertising, amounting to $50,000. With this information, statements of marginal earnings and investment are developed as follows:

STATEMENT OF MARGINAL EARNINGS PER YEAR

Added sales		$1,000,000
less: Direct material & labor	$450,000	
Variable manufacturing overhead	100,000	
Variable general & administrative expense	150,000	
Depreciation on added tooling, machinery, and plant required	20,000	
Amortization of specific development engineering and start-up costs	50,000	770,000
Marginal pre-tax earnings		$ 230,000

STATEMENT OF MARGINAL INVESTMENT

Engineering product development & start-up costs @35%	$ 87,500
Cash	40,000
Accounts receivable	120,000
Inventories	200,000
Prepaid expenses	4,000
Plant and equipment (@50% of original expenditure)	50,000
Land	2,000
Subtotal	$ 503,500
less:	
Payables and accruals	$ 40,000
Income tax accrual (26% of earnings)	59,800
Total	$ 403,700

RETURN ON INVESTMENT

$$\frac{\text{Marginal earnings } \$230{,}000}{\text{Average investment } \$403{,}000} \times 100 = 57\%$$

The rate of return on the proposed investment in engineering product development exceeds the demanded rate of return and is financially desirable.

Straight-Line Projections with the Learning Curve

by DEWEY W. NEAL*

THERE IS one important factor too frequently neglected in any discussion of the learning curve, a newly popular topic in accounting literature. Most articles expounding the learning curve point out that the learning curve formula describes a straight line on log-log paper. This is true as far as the formula itself is concerned but what most authors fail to point out is that, while the formula may describe a straight line, the plotting of actual cost data on log-log paper may not describe a straight line. Therefore, some clarification or qualification appears to be in order.

For the learning curve formula to be of any significant value as a cost projection tool, a straight-line projection must be indicated. Many times, however, it is discovered that upon plotting the cost experience, a "hump" or "scallop" is revealed. Before a reasonable prediction can be made, these irregularities may have to be corrected by repositioning the data so that it simulates a straight line. This can be accomplished by replotting the experience further out or further back laterally on the log-log paper. However, the prime consideration is not that the actual experience must necessarily describe a straight line but that a reasonable straight-line projection can be made. This brings in additional considerations that will not be expanded here.

Of course, there are a number of reasons why a set of unit cost data will not describe a straight line when plotted on log-log paper:

1. Previous experience on like or similar production items.
2. Proven tools, or lack of them.
3. Experience, or lack of experience by employees.
4. Current item of production may have components common to previous production, etc.

As a result, before accurate projections can be made by use of the learning curve formula, and assuming availability of a certain amount of actual cost data, the cost data must be positioned on the log-log paper so that it best indicates a straight-line projection, for then and only then does the application of a mathematical formula which predicts a straight line serve a useful purpose.

* Project Cost Coordinator, Boeing Airplane Company, Wichita Division, Wichita, Kansas.

Effective Reporting of Research and Development Costs

by CLAUDE E. HALE

IN MANY COMPANIES the research and development function is a supplementary activity and does not command the attention that the manufacturing or production activity does in the matter of costs. Most business organizations focus their attention on the manufacturing function and demand complete and detailed cost systems and reports in this area. However, many of these same companies are satisfied with a periodic lump-sum total of their engineering costs.

Built-in Difficulties

Firms whose primary business purpose is research and development are often lacking in proper cost planning and control. This lack in a research and development organization is due primarily to three factors.

The first factor is that, generally, the managing executive of this type of business is the technical director with a technical rather than administrative background, whose interests are guided by this background. He is generally aware of the total resources of the business available and realizes that his technical program must be kept within the limits of these resources but he usually does not understand the matter of correlating an effective project cost system with his technical program. Since we are prone to oppose things we do not understand, his attitude is likely to be that of opposition or at least lack of cooperation. However, this problem is minimized where one or all of the following conditions are present:

1. The technical director has an interest in financial and administrative affairs or has some training or experience in this area.
2. The superiors of the technical director hold him responsible or accountable for administrative and financial success as well as for technical progress.
3. The technical director has faith and confidence in the controller and supports his program though not completely understanding the mechanics of it.

CLAUDE E. HALE, Tulsa Chapter, 1958, is Chief Accountant and Assistant Treasurer of Well Surveys, Inc., Tulsa, Oklahoma. He previously worked for Century Geophysical Corporation as Cost Accountant. Mr. Hale holds a B.S. degree in Business Administration from Tulsa University.

The second factor is the hesitancy of technical personnel to prepare and submit detailed time reports regularly. Professional engineering people are often regarded as somewhat "above" the class of employees who are required to account for every hour of the workday. Also, some technical directors are reluctant to enforce such a timekeeping imposition on the professional people. However, on the whole, engineering workers are as interested in helping to accumulate cost information as is any other group of workers. Actually, laboratory personnel are well accustomed to record keeping, since they record their work activity in notebooks daily or at regular intervals. They can readily determine time spent on various projects and other activities by referring to the notebooks.

In our company, at the present time, it is considered unnecessary to require daily submission of time reports. Although each individual should record his time daily, the time slips are submitted weekly. Our experience with this phase of our cost system has been one of excellent cooperation by all concerned. Any problem in this area can be solved by having or securing the support of the technical director.

The third factor is the difficulty in planning the physical progress of research projects. It is difficult, if not impossible, to set an accurate timetable and related plan of expenditure for these projects. Unlike the production manager who measures production progress by comparison of actual expenditures with pre-set standards, the technical director does not have such standards available as a measuring device.

This problem is solved by utilizing, separately, reports of physical progress, submitted by those directly responsible for the projects, and financial reports, issued by the accounting section. The technical director then has the complete picture of two different phases of his operation rather than the summarized, incomplete picture provided by a combined report. A combined report usually attempts to show physical progress in terms of dollars expended. The system of separate reports has proved to be a more effective plan for our company.

Project Costs Recording and Reporting

As mentioned previously, all our technical employees record the hours worked on each project each day. They also record on their time slips items of a general nature, such as vacation, illness, holidays and training schools. The weekly time

slip is called project pay-roll cost record, since it also serves as a pay-roll record for exempt personnel.

Each Monday morning the project pay-roll cost records are collected by the secretaries of the various engineering groups and delivered to the accounting department. Each individual report is checked in to make certain all are received and the hours posted to the project labor summary. This summary sheet is prepared for each project on a monthly basis. The time spent on the project is recorded each day by each employee, and the labor class he belongs to is marked. At the end of the month individual hourly rates are applied to arrive at individual and total amounts. The information is then summarized by class of labor. Our direct research or engineering labor classifications are: project supervisor, project engineer, engineer and technican. Average rates for each of these labor classes could be used to best advantage in some instances. However, actual labor rates serve our purpose better at the present time.

A carbon copy of this summary sheet, without labor rates and dollar amounts is given to the appropriate senior project supervisor at the end of the month. He passes it on to the project supervisor. These basic labor reports are helpful to the supervisors in the preparation of their monthly technical progress reports and in planning their projects to utilize the personnel most efficiently.

In accumulating and summarizing the labor, material and overhead charges for each project, an Individual Project Cost Statement (Exhibit 1) is prepared. On this worksheet, information is recorded for the entire year, by the month. The labor hours and dollars are obtained from the project labor summaries. The project material charges are taken from a subsidiary ledger of the check or voucher register.

Individual Project Cost Statement

Project Number 212

Project Title _____

Fiscal Year 1961	Project hours PS	PE	Eng.	Lab.	Total Hours	Dollars	Material	Total direct cost	Eng. overhead	Total eng. cost	Adm. overhead	Total cost	Total year to date
Nov.	95	16	194	46	351	1,503	306	1,809	1,503	3,312	376	3,688	3,688
Dec.	101	0	203	60	364	1,497	500	1,997	2,036	4,033	449	4,482	8,170

EXHIBIT 1

The engineering overhead rate for the month is computed in a special section of the Engineering Expense Statement (Exhibit 2). From total engineering expense, direct material and direct research labor totals are subtracted to obtain the engineering overhead amount. This amount is divided by direct research labor dollars to obtain the engineering overhead percentage or rate. This rate

Engineering Expense Statement

	Month of December, 1960			Cumulative for 2 Months		
	Actual	Budget	(Over) Under	Actual	Budget	(Over) Under
Supervision	6,100	6,100	—			
Engineering salaries	17,000	17,300	300			
Technical labor	4,700	4,700	—			
Engineering services labor	3,100	3,000	(100)			
Clerical	1,500	1,500	—			
Pay-roll taxes and insurance	1,200	1,200	—			
Total personnal	33,600	33,800	200	67,000	67,600	600
Direct research materials	2,700	2,000	(700)			
Materials and supplies	1,200	1,000	(200)			
Total material	3,900	3,000	(900)	6,500	6,000	(500)
Travel	600	600	—			
Consulting	700	700	—			
Telephone and telegraph	450	500	50			
Stationery and office supplies	500	350	(150)			
Library	100	150	50			
Dues and subscriptions	50	100	50			
Drafting and printing supplies	300	200	(100)			
Total miscellaneous	2,700	2,600	(100)	5,300	5,200	(100)
Utilities	1,200	1,400	200			
Depreciation and amortization	5,200	5,200	—			
Property and miscellaneous taxes	1,800	1,800	—			
Insurance - general	400	450	50			
Total fixed	8,600	8,850	250	17,500	17,700	200
Total Engineering Expenses	48,800	48,250	(550)	96,300	96,500	200
Less: Direct material	2,700			5,200		
Direct research labor	19,530			39,000		
Engineering overhead	26,570			52,100		
% engineering overhead to direct research labor	136			134		

EXHIBIT 2

EXHIBIT 3

Project Status Report

December, 1960

Page ___ of ___

Project Title	Project No.	Labor		Overhead		Material	Month Total	Year to date
		Hours	Dollars	Eng.	Adm.			
	212	364	$ 1,497	$ 2,036	$ 449	$ 500	$ 4,482	$ 8,170
	213	1,916	7,826	10,646	2,348	1,000	21,820	40,581
	214	1,230	6,638	9,030	1,991	200	17,859	23,860
	322	538	1,783	2,427	535	600	5,345	9,548
	323	563	1,786	2,431	536	400	5,153	7,367
Total Project Costs		4,611	$19,530	$26,570	$ 5,859	$ 2,700	$ 54,659	$89,526
Indirect Research Labor:								
	General		$ 482					
	Sick		587					
	Vacation		735					
	Training School		366					
			$ 2,170					
Total Research Labor			$21,700					

is applied to the total labor dollars recorded on the individual project cost statements to determine the engineering overhead dollars to be applied to each project. The administrative overhead rate is obtained by dividing total administrative expenses by the direct research labor dollars. This rate is then applied to the total labor dollars on the individual project cost statements to obtain the administrative overhead amounts.

The individual project cost statement is a valuable record although designed for use only as a worksheet. At any time during the year, totals for the year to date of any or all the cost items recorded on the form can easily be obtained. Project reports for almost any purpose can be readily prepared from the information provided by this record. Also, the statement itself in worksheet form is available to the technical director or senior supervisors for review at any time.

Project cost information is summarized for presentation to management on the Project Status Report (Exhibit 3). This report is prepared monthly and shows total labor hours and dollars, engineering overhead, administrative overhead and material costs of each project, and total projects for the current month. It also shows the total cost of each project for the year to date and appropriate total of the cost of all projects for that period.

The general activities or indirect research labor items are listed on this report in order to complete the picture showing utilization of all engineering labor dollars.

In order to show the application of all operating expenses to the projects, the project status report is used in conjunction with the operating expense statements. The figures in the project status report can be compared with the figures indicating direct material, direct research labor and engineering overhead on the engineering expense statement. Another comparison of figures shows that the total research labor amount on the project status report equals the total of engineering salaries and technical labor amounts on the engineering expense statement.

This project cost recording and reporting system serves our purpose very well. The various reports were designed to fit particular requests of our technical director and his corps of technical supervisors. Therefore, they understand the reports and utilize them. The system can be utilized with minor revision in many situations which differ from ours. In pointing out the simple fundamental principles of our project cost system and its relationship to our operating expense reports it is our hope that it might be of some help to others who find themselves in a situation similar to ours and are interested in more effective project cost reporting.

Accounting for Labor — A Case Study

by ALLAN D. PFLUGSHAUPT

THE BASIC requirement for any system of accounting for labor is by nature twofold:

1. The ability to pay employees promptly and accurately.
2. The ability to account for and distribute labor dollars to the proper cost classifications.

It was to this latter requirement that our company directed its attention and developed a system which required job distribution cards to be prepared only on an exception basis.

The distribution of direct labor charges to specific jobs or categories was formerly accomplished by use of job distribution cards, which required all direct labor workers to record hours worked on each job. In effect, each employee was required to "account" for his own time. This meant that close supervision of this recording had to be provided at all times, but even so, this method was the cause for concern in the following areas:

1. *Accuracy of time charging.* In any system requiring employees to account for their time, the accuracy of the records generated can and should be questioned.
2. *Time requirements.* The time required by operators and foremen to record and verify time charged to various jobs was time-consuming and a hindrance to production.
3. *Processing costs.* In effect, there was a duplication of effort in processing "hours worked," which contributed to higher overhead costs. The duplication occurred because it was necessary to process both an employee time card and job distribution card for each employee.

The cost center is the core of the system. A cost center, is best described as an area of manufacturing in which it is possible to associate the standard value added to units flowing through the area with actual costs incurred. Within a cost center every worker must be a standard cost worker, one whose labor is included in the standard labor cost of units processed. To effectively utilize supervision and plant layout, a cost center can be comprised of one or more sections and production lines, which may be working on one or more jobs simultaneously. A section, in this case, refers to the permanently assigned work station of an employee.

ALLAN D. PFLUGSHAUPT, Cedar Rapids Chapter, 1959, is Staff Assistant to the Controller of Collins Radio Company, Cedar Rapids, Iowa. He is an honor graduate of Drake University with a B.S. degree received in June 1959.

Actual Labor

All work performed in a cost center can be divided into (1) standard and (2) nonstandard. Standard labor is defined for this purpose as work performed by direct labor workers in their home section on assembly units for which a scientific industrial engineering standard has been established. For this type of work, which constitutes the vast majority of a direct labor worker's time, the employee is not required to distribute his time. Nonstandard labor consists of effort spent on auxiliary work orders, engineering projects for which the establishment of standards is not warranted, and certain items of personnel policy. In addition, it includes time spent by a direct labor worker while "on loan" to another section, or while performing work in his home section which has been "farmed out" by another section. All effort of this nature is still distributed to job charge numbers by the employee, who for this purpose makes use of a nonstandard job distribution card. In our manufacturing operation, work of this nature is relatively minor in comparison with our over-all operation.

In our company, all manufacturing, engineering and auxiliary work orders are assigned a six digit number. For the purpose of mechanization and compatibility, it was necessary to assign identifying labor charge numbers for standard production work as follows:

61-7xxx—Labor performed by a cost-center worker attached to a section other than his home section, where he is permanently assigned. The three-digit suffix denotes the section to which he is loaned.

61-8xxx—Labor performed by a cost-center worker within his permanently assigned section. The three-digit suffix denotes the number of the worker's home section.

61-9xxx—Labor performed by a cost-center worker on work "farmed out" by another section. The three-digit suffix denotes the section which has farmed out the work.

All other nonstandard distribution work performed by an employee is charged to the normal six-digit number of the work order itself.

For cost-center employees, the total time as recorded on the employee's clock or attendance card is converted to dollars from our master rate deck. This amount is charged as cost-center labor and identified as 61-8xxx labor. Thus an employee who works on standard labor operations in his own cost center, is not required to distribute his time.

All time recorded on nonstandard distribution cards is converted to labor dollars and the individual jobs worked on are charged. The total of the nonstandard distribution amounts charged by cost-center employees is a credit to

301	60827	John M. Doe			2/12/61		A. D. Pflugshaupt				
SECTION	CLOCK NO.	EMPLOYEE NAME			DATE		FOREMAN'S SIGNATURE				
NON STANDARD JOB CARD (PRODUCTION) PD-1059-01 (Rev 11/59)	Acct. No. 7356 PERSONNEL POLICY		JOB CHARGE OR ACCT. NUMBER	MON	TUE	WED	THU	FRI	SAT	SUN	TOTAL
	Blood Donation	1	61 7302	4 2							
	Personnel Testing										
	Union business necessitating leaving department	2	61 9306		2 1						
	Labor relations and labor mg'mt meetings	3	37 1649					1 4			
	Veterans annual physical	4									
	Training Programs and Schools	5									
	Fire Brigade Drills	6									
		7		SAMPLE							
		8									
	REPORT TIME TO NEAREST TENTH	9									
		10									

EXHIBIT 1

the 61-8xxx amount charged as outlined in the preceding paragraph. Exhibit 1 is a sample job distribution card.

The actual direct labor expended for each cost center is the sum of the labor performed by the various labor sections of the cost center:

Section 301

Gross section labor (61-8301 charge number)	$40,000
less: Time recorded by Section 301 employees on non-standard distribution cards	1,000
Net section charge (61-8301)	39,000
Time spent by employees loaned from another section (61-7301 charge number)	3,000
Work loaned out to another section (61-9301 charge number)	500
Actual labor chargeable to Section 301	$42,500

Standard Earned Labor

Standard earned labor is determined for each cost center by extending the equivalent units produced times the current scientifically derived industrial engineering standard for the unit. It is mechanically obtained by processing "line credits," which in our operation are controlled by a Dennison Ticket. The ticket is an eight-part form, as follows:

(1) Assembly input
(2) Assembly output
(3) Inspection
(4) Test input
(5) Test output
(6) Partial
(7) Stores tag
(8) Identification

The part number, order number, issue group number and serial number printed on the face of each detachable part are punched into each ticket. This punching is done in code on a ticket print and punch marking machine which does the printing and punching simultaneously. The result is that each part of the ticket can be mechanically processed and interpreted in time to permit daily shop performance reports, expressed in units, to be in the hands of section heads and shop superintendents by noon of the following day.

Each portion of the ticket is detachable from the others and the ticket itself is attached to a related part or assembly. Attaching the ticket to the part or assembly is accomplished by the line foremen. In addition, for each portion of the ticket there is an assigned "pull time," at which that portion is detached by the foreman and forwarded to the EDP center for processing.

In connection with the use of the line credit ticket, there is a shop rule which must be adhered to if the system is to produce valid cost accumulation. The rule is that "no work can be performed on any part or assembly carrying a standard, which does not have a ticket attached to it."

For any given period of time, the standard earned labor of a cost center consists of the standard labor earned on units completed since the close of the previous period, plus a portion of the standard cost related to units started in production since the close of the previous period. Referring to the pull times for the various parts of the line credit ticket, we find that Part I (Assembly input) is pulled when the work on a unit is first started. Similarly, Part II (Assembly output) is pulled when the work is completed and the unit is sent to inspection. By pricing these two parts of the line credit ticket at standard and applying an equivalent production factor, as determined by inventory, we are able to arrive at the standard earned labor for a given section, as follows:

	Total standard cost value	Equivalent production factor	Standard earned labor
Pulled assembly-in tickets (Part I)	$100,000	50%	$ 50,000
Pulled assembly-out tickets (Part II)	50,000	100%	50,000
			100,000
Standard earned labor in process (Beginning of period)			(40,000)
Standard earned labor (Current month)			$ 60,000

Cost Center 101	Actual assembly and test labor	Actual inspection labor	Total actual labor	Standard earned labor	Labor variance	Variance rate % of standard labor
Assembly #1						
316	$49,189.09					
325	18,076.40					
345	31,604.91					
Total	98,870.40	$13,475.88	$112,346.28	$92,369.12	$17.977.16	19.46
Cost Center 102						
Assembly #2						
348	52,632.85					
349	45,617.21					
Total	98,250.06	13,677.33	111,927.39	98,618.47	13,308.92	13.50
Cost Center 103						
Assembly #3						
360	25,202.51					
380	40,006.71					
Total	65,209.22	9,079.09	74,288.31	73,842.88	445.43	.60
Cost Center 111						
Assembly inspection #1		36,232.30				
Proration to 101, 102 & 103		(36,232.30)				

A computer application accomplishes this same type of computation for each section on a periodic basis. In addition, the standard earned labor of all sections within a cost center is mechanically grouped and summarized by cost center.

Labor Variance

The difference between a cost center's actual labor performance and standard earned labor is recognized as variance. From this variance a rate is computed for each cost center. The information necessary to determine a cost center's rate is provided in the form of tabulating runs. From these runs a worksheet is prepared to determine the labor variance rates (see p. 73).

Since an inspection center services more than one assembly cost center, it was not feasible to provide for the accumulation of the standard earned labor for inspection centers. Therefore, in the above worksheet, it will be noted that a proration of the inspection cost center's actual labor was made to the three assembly cost centers. This proration is necessary because the build-up of the standard labor used to compute the standard earned labor of each cost center includes a provision for inspection labor. The proration to the respective assembly cost centers, benefiting from the service, is made in the ratio of each assembly cost center's actual labor to the total actual labor of all benefiting cost centers.

Conclusion

Prior to its adoption, application of the system, on a limited test basis over an extended period of time, proved it capable of producing results within the acceptable range of accuracy. The full-scale adoption of the system in our assembly manufacturing operation has enabled us to achieve:

1. More accurate prime costs.
2. Reduced operating costs in the pay-roll and manufacturing cost accounting departments.
3. Reduced time required for financial statement preparation.
4. A timely means for reporting shop performance.

Possibly even more significant is the fact that the methods employed were resolved by taking an objectively serious look at several fundamental accounting concepts. It is only in this way that we, as a profession, can be ensured of continued growth and progress, it is the implementation of new concepts that makes it possible for us to open up new accounting frontiers.

Controlling the Sales Dollar

by E. C. CONLEY

IN RECENT YEARS medium-sized corporations have taken tremendous strides in implementing operating cost controls. No element of cost has been too insignificant to be identified and challenged for justification. Impressive sums have been expended on systems. Methods have been mechanized to give accurate and timely information. Despite this seemingly all-out effort, the first cause of profit—the sales dollar—all too frequently has been neglected. This neglect, springing mainly from the difficulty of controlling such an intangible, has been particularly evident in those enterprises which, lacking proprietary products, have had to sell on a conversion basis.

How does such a corporation, having good budgetary and other cost controls and a cost-minded management with ability to use these operating tools, control its sales dollar? This article proposes an addition to its assortment of management aids—a workable means of control of its revenues.

Two points are presented as means of effecting such control:

1. Measure the sales performance on the profitability of the business accepted rather than the volume of business secured.
2. Provide the sales activity with reliable information on its penetration of the available market.

Measuring the Sales Activity on Profits

Organizing the sales division. As an initial step in the operation of this plan, the sales activity will be organized as a separate line division of the corporation. Its executive head will have an organizational status equal to that of other line division heads. As such, he would be responsible to the chief executive officer or a delegated subordinate. This is imperative to the successful operation of the plan, since the sales division must be free of all entanglements with other line divisions and must be free to rise or fall on its own merits. Let us assume that this has been accomplished and that there is a sales division headed by its own general manager responsible to the executive vice-president of the corporation.

Internally, the operating components may be organized on either (1) a

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E. C. CONLEY, Detroit Chapter, 1949, is Assistant to the President of Sheller Manufacturing Corporation, Detroit, Michigan. Formerly he was associated with Ford Motor Company.

product basis or (2) a territorial basis or (3) a customer basis. Irrespective of the internal concept adopted, each component will be headed by an individual responsible for performance to the general manager.

In addition, certain staff functions will be performed by the sales division to aid in its operation. Needless to say, these functions may be expanded or contracted as the particular sales mission requires. Summing up graphically, it appears as shown on Exhibit 1.

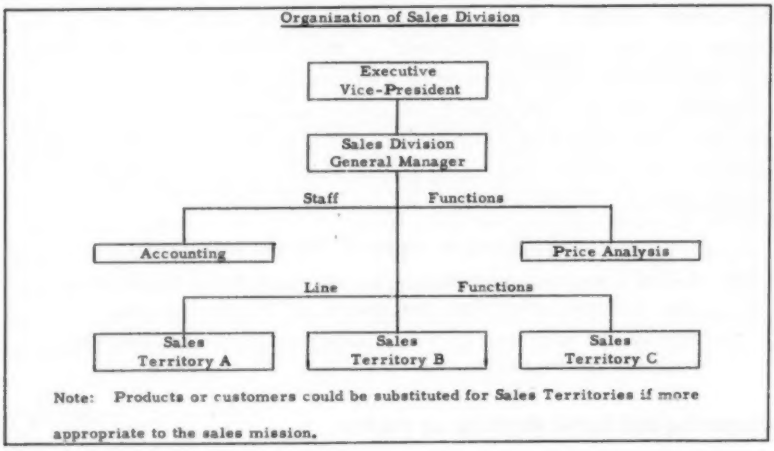


EXHIBIT 1

Setting the task. Sufficiently in advance of the beginning of the year, corporate management determines the earnings desired for the coming year. This decision is based on the best estimate of all future requirements including dividends and fixed and working capital. This sets the task for the corporation. How then will this task be passed on to the operating divisions, including the sales division, of the corporation?

Establishing the profit task. Initially, the task of each operating division will be determined by the value of the corporation's assets employed or to be employed in each division, those employed directly by the division plus allocated corporate division assets. The assignment of required corporate earnings is established for each division proportionately to its share of the total assets, on a percentage basis.

Implementing the profit task. The required earnings for the division will next be translated into division product selling prices. To accomplish this, each division first makes the best possible projection of its costs for the coming year. Several pre-requisites are necessary to accomplish this task:

1. Direct material purchase costs supported by firm quotations from vendors.
2. Estimates of direct material usage requirements.
3. Possible substitutions of direct material.
4. Direct labor requirements as to the time required and the rate at which to be paid.
5. Volume of business anticipated on each item and for the division as a corporate unit.
6. Realistic estimates of overhead requirements at the volume anticipated, preferably in the form of flexible budgets for each area of responsibility, built on a "how much we can afford to spend" concept.
7. An expression from corporate management as to what extent cost savings are to be anticipated in division selling prices. (It follows that such a system as is outlined here precludes the inclusion of cost excesses in division selling prices.)
8. The estimated cost effect of feature differences between the item quoted and a similar item previously supplied.

The price formula. Armed with this data the division proceeds to establishing a basic pricing formula, which is computed as follows:

Estimated direct material costs	$_____
Estimated direct labor costs	_____
Estimated overhead	_____
Total estimated costs at planned volume	$_____
Pre-tax required earnings for the division	$_____
% of markup	_____%

To achieve the desired results the division will:

1. Prepare an estimated cost of each item as well as of the feature differences between the item currently in production and the like item for the new year.
2. Arrive at a division selling price by applying the markup percentage to this cost estimate.

Should it be to the division's best interests, the markup percentage could be determined by product line in a manner consistent with the determination of the pre-tax corporate earnings.

EXHIBIT 2

Hypothetical Corporation
Sales Division
Income Statement for Month Ending—for Sales Territory A
Salesman No. 1

Customer	Item sold	Units sold	Net sales			Sales division cost of sales	Gross margin	Distribution costs				Pre-tax profit
			Gross sales @ customer selling price	Returns, allowances and discounts	Net			Directly related		Distribution & allocation of general sales division expenses	Total	
								Salesman's salary & expenses	Other			

EXHIBIT 3

Hypothetical Corporation
Sales Division
Income Statement for Month Ending ----

	Net sales			Sales division cost of sales	Gross margin	Distribution costs				Pre-tax profit
	Gross sales @ customer selling price	Returns, allowances and discounts	Net			Directly related		Distribution & allocation of general sales division expenses	Total	
						Salesman's salary and expenses	Other			
Sales Territory A										
Sales Territory B										
Sales Territory C										
Combined for the month										
Prior months										
Combined for year to date										

Processing the sales price to the customer. The division selling price is forwarded to the price analyst of the sales division. Since the division selling price will be the sales division's cost, the function of the price analyst's office assumes important proportions. One of the prime functions of the price analyst is the investigation and analysis of competitive price levels. Much care is required to ensure that the business is quoted at the proper level—neither too high nor too low. The former would price the corporation out of the market; the latter would strike a blow not only at the current profit position of the sales division but also at the corporation itself. Nor should the price analyst be forced to bear this heavy responsibility alone. A major decision of this nature should represent the combined thinking of all the key personnel in the sales division. It should include the consensus of the general manager's and sales territory manager's best thoughts. Quite possibly, the proposed price to the customer will make the product a "leader" item and, if such be the case, the advantages and disadvantages should be related clearly and accurately to the over-all profit mission of the sales division.

Inter-divisional accounting. Once the business is secured, the sales division confirms the supply of the item with the supplying division. All customer billings will be processed by the supplying division except for deliveries effected by means of internal transfer sales and receivable amounts, which will be transferred to the sales division. Billing by the supplying division to the sales division will be accomplished monthly, again by internal transfer. All inventories are carried by the supplying division. Similarly, all credit and collection matters are a sales division function.

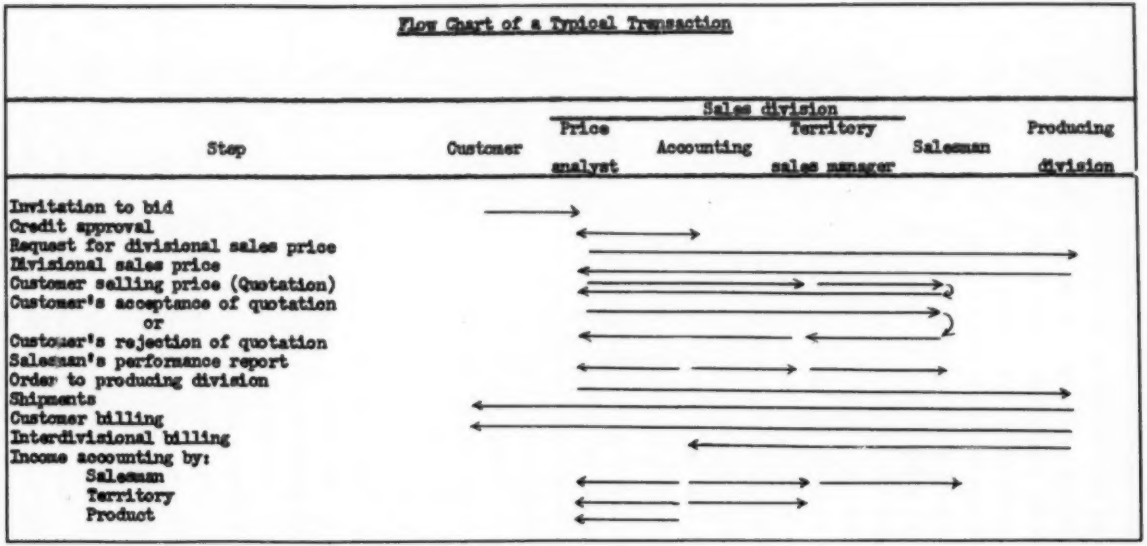
The yardstick. Thus, it will be possible to prepare an income statement for the sales division. By so doing, the margin gained or lost by the sales effort, together with the attendant distribution costs, will be properly portrayed against the sales division. Subsequent analysis, as indicated on Exhibit 2 will reveal the true profit performers and the real loss leaders.

Examples of income statements reflecting the results of the sales division's activities are shown on Exhibits 2 and 3. A flow chart of a typical transaction is shown on Exhibit 4.

Penetration of the available market. In order that the sales division may have the latest information available on its progress in securing business, a system of automatic analysis of market penetration should be installed. Upon receiving an "invitation to bid" the salesman initiates a multi-copy form, "quotation to customer." To properly identify the item being quoted, the salesman will execute the following:

EXHIBIT 4

Flow Chart of a Typical Transaction



1. Date of the inquiry.
2. Date when mailed by the salesman.
3. Date quotation required.
4. Number of units required by the customer and at what intervals.
5. Material specifications.
6. The customer's engineering references (drawing numbers or other data reference).

Upon completion of these, the salesman forwards the invitation and the quotation to the price analyst. The salesman retains a copy of the quotation in an open file, so labeled to identify the data as being held pending disposition from the price analyst.

Earlier in this article, it was pointed out that the price analyst examines each selling price prior to its release to the customer. In order to make this function of his office more effective, the price analyst scrutinizes each quotation. Some of these will be discarded as not being suited to the particular product specialties of the corporation, others will encounter delivery problems, and so forth.

The scrutiny completed, the price analyst detaches a copy for his open file and forwards the remaining copies of the set of the quotation to the producing division with a request for divisional sales price. Any allied data are appended to the quotation set, such as drawings, packing and shipping instructions, special material specifications—in fact any point germane to the design, production and distribution of the item.

Upon receipt of the divisional sales price, the price analyst of the sales division examines it with a twofold query:

1. Is the price competitive?
2. Will the price permit sufficient markup to provide the sales division with its required pre-tax earnings?

If the divisional sales price has been properly constructed and if the item is consistent with the general product structure of the corporation, the answer to both of these questions should be in the affirmative. Satisfied with the results of his probing of the market and the profit potential of this piece of business, the price analyst notes the customer selling price on the quotation and forwards the set of documents to the territory sales manager.

Here the sales force takes over. The selling price will be presented to the customer after a thorough plan of selling is prepared by the territory sales manager. Persons far better qualified than this author have written many reams on the art of planning a sale. Suffice to say here that no piece of business is

too small to go unplanned. Prearranged basic selling strategy is the most important feature of this or any other plan of sales performance.

The success or failure of the long task of preparing the selling price would now rest with the sales force. After all efforts had been exhausted the results would be reported on the quotation. At this point, the price analyst (to whom the report will be directed) is more interested in business lost than in business gained. The report of the salesman points out specifically if the business was lost due to:

1. Unit price
2. Tool price
3. Facilities
4. Delivery
5. Late quotation
6. Any other pertinent reason

The salesman's report also points up any other facts known about the lost business and possibly some hint of a new technique in manufacturing could be learned and reported. The salesman's report will be accurate only if he took the time and effort to conduct a review with the customer's purchasing people. Again, such a maneuver would require real selling ability on the part of the sales force. The corporation has lost some business; somewhere along the long line something has gone amiss. The salesman with his probing of the customer is in a good position to discover the reason.

All these documents and steps in their processing would be meaningless if the corporation did not profit by them in useful information. Accordingly, the price analyst releases periodically a salesman's performance report for each sales territory. The report includes finalized business only; new business by product, quoted and received, and the percentage of penetration by product are indicated for each salesman within the sales territory. A combined report for the entire sales division is a natural progression. Similarly, a report of the reasons for the lost business will be prepared. In addition, a report of pending and open quotations could be reported at any time.

We have tried to show in this article that it is possible to measure the sales effort in a medium-sized corporation doing business in a nonproprietary market. By necessity, many details have had to be assumed, or eliminated from this description. The conclusion is plain, however. Not only is it possible, it is very practical to implement such control.

Simplified In-Process Inventory Costing

by HENRY M. HARMAN

HOW CAN a job shop with hundreds of diverse products constantly in process economically value its inventory at any given date? Compound this with a situation that requires partial shipments and a drawn-out shipping schedule of these production runs, and you have a complex problem.

Our company was abruptly faced with this challenge a few years ago. Prior to that time, one or two of our long-term employees had taken physical inventory of all of the goods in process each month. These men were able to give a fairly accurate count of the materials in process by working one Saturday a month. However, as our business grew, it became increasingly difficult to complete the required inventories, even though additional personnel was utilized. In addition to the sheer increase in the gross amount of business, the products tended to get more complex with component sub-assemblies becoming commonplace. Moreover, these component parts were often common to more than one finished product, which complicated the inventory identification problem. Our product mix was constantly changing, with resulting fluctuations in inventory composition. In a high percentage, the jobs were custom jobs, not likely to be repeated. Partial shipments were usually made on open orders, while other parts of the same order were at several stages of production.

We took a look at what other techniques were available to give us a reasonably accurate inventory. Our cost system relied upon individual material requisitions for each item issued to each job. These requisitions were priced and posted to individual job cost sheets each month. Direct labor personnel recorded their daily time on individual job tickets. Subsequently, job tickets were balanced against the pay roll, noted on the individual job cost sheets, also by month, and summarized by eleven designated product classes. In general, these classes were indicative of the type of product and its general manufacturing process. The gross profit margin on these products varied from not much better than a break-even proposition to a substantial margin of 40 percent. Thus, our profit and loss picture fluctuated greatly, depending upon the product-mix variations.

After considerable study, we hit upon the idea of a perpetual inventory of work in process, with labor and material costs spent as the input, the output consisting of jobs completed or, as we designated them, "jobs closed out," and

HENRY M. HARMAN, New Haven Chapter (Philadelphia, 1952), C.P.A., is Manufacturing Manager and Controller of the Connecticut Hard Rubber Company, New Haven, Connecticut. Mr. Harman holds a B.S. degree in Business Administration from Lehigh University. He did graduate work at Tulsa University.

estimated costs of partial shipments. Instead of posting the individual material and labor tickets to each job each month, we now sort them by product class and obtain a control total of the input for each class for the period. The material input figures are controlled by the raw material total from the accounts payable journal adjusted by the beginning and ending inventories and the labor distribution control in the pay-roll journal. The class totals are posted to our Product Class Inventory Control Sheet (Exhibit 1) on Line B. Cards are then sorted by job number and filed away in a drawer, awaiting completion of the order.

In order to facilitate our handling of the paperwork, we have established a standard labor and manufacturing overhead total cost per hour. Instead of extending each labor ticket by either the actual or departmental average labor rate and subsequently adding a manufacturing overhead cost to this amount, we simply maintain a control of hours. Thus, innumerable hours of clerical work in extending, proving and totaling detail cards have been eliminated.

Our shipments of each product class are then summarized and posted to the product class inventory control sheet. We create individual shipment tickets as a by-product of our billing process. These cards are then filed away as shipments in process once again, awaiting completion of the order, just as was done with the labor and material cards for the period. Our next problem was how to determine the gross profit margin of each class in order to estimate the cost of these shipments. Further study indicated that a moving three-month average gross margin on completed orders would be satisfactory. In other words, we summarize our last three-month experience of jobs completed for each product class and use that margin to cost out our shipments for the month.

As orders are completed, we receive notification from our production control department. We then remove the labor, material and shipment cards from the file and post this historical data on individual job cost sheets. These sheets are sorted by product class and summarized by cost elements, i.e., material, labor cost, general and administrative, shipments made and profit. Summary totals of cost elements are then posted to Line C of the applicable product class inventory control sheet.

We are now in a position to ascertain the net value of our work in process. By adding the input to and subtracting the orders completed and closed from the beginning inventory totals, we arrive at the estimated net book value of the inventory of each class. Unclosed labor hours, material costs and partial shipment values can be verified by a count of the cards in our "in process" file. That is, the tickets remaining in the drawer are the details of the control sheets. We also know what the profit margin was for the jobs just closed

Product Class Inventory Control Sheet

	Class 1	Hours	Amount	Material	Total	Ship	Cost of ship	Net inv.
A	Beginning bal.	20,000	100,000	70,000	170,000	100,000	60,000	110,000
B	Input	30,000	150,000	95,000	245,000	170,000	102,000	143,000
C	Closeout	27,000	135,000	98,000	233,000	180,000	108,000	125,000
D	Ending bal.	23,000	115,000	67,000	182,000	90,000	54,000	128,000

EXHIBIT 1

out and, of course, can examine any substantial deviation very easily by referring to the individual job cost sheets.

There are some inherent dangers in this system which could distort the inventory picture. If the actual gross profit margin of the partial shipments is substantially different from the past three-month average, the net value of the inventory is obviously in error to that extent. An example of such a situation would be a job which produced high scrap. Such a situation would cause the inventory to mount until the job was closed out. We are attempting to solve that problem by costing our scrap as it occurs and adding it to our input figure with a credit made out to the jobs in process. In this way, we reflect the cost of scrap during the period in which it occurred and do not distort our profit margin by waiting a few months until the job is closed out. Better than average performance would cause a low inventory, which would understate current profits.

We have established two additional rules in order to help minimize the amount of error which could be built into such an inventory. First, we note any job which has not been closed out for a period of three months and request a special inventory of this job from our production people. Second, when we notice that any job has accumulated shipments in excess of a certain figure, we request a physical inventory of it. Since the jobs which fall into either of the above categories are sizable ones, we are apt to have reasonably accurate unit and component cost data from which to value a physical count.

The net result of this inventory method is that we are able to obtain monthly inventory figures for all product lines. Moreover, this information is available very promptly. In our case, we can obtain this data in summary form within a week after the end of any fiscal period. In fact, we look forward in the near future to weekly closings which will enable us to do a better job of analyzing what happened. Such a prompt analysis would certainly be a help as we would tend to be reporting current data, not past history.

To simplify our inventory closings, we use a 4-4-5 week month which allows us to process full weeks of labor hours and material costs, rather than either breaking the final week of a fiscal period into two parts or estimating costs applicable to the period.

At this point, we believe we have scored at least four major improvements:

1. A better inventory valuation.
2. Data obtained at a greatly reduced cost.
3. Data available more quickly.
4. Workload spread throughout the month rather than pyramided at closing time.

Use of Recording Equipment Reduces Timekeeping Costs

by THOMAS H. MORTON

OVER the past several years we, like many other manufacturers, have experienced an evolution in our time-recording and processing of labor data. The constant aim has been to obtain more complete and accurate labor information at the same or lower clerical costs. The step-by-step history—and final results—are an illuminating record of experience which may be helpful to others.

For many years our hourly shop employees made out their own job tickets, a procedure which, of course, had many disadvantages. Among them were incorrect time readings, poor legibility and incorrect designation of part, group and job numbers. From this point we went to the other extreme and placed time clerks in each department but were plagued with the problem of an uneven workload for the clerks. Some had too many employees under them and some, because of location of department, had too few employees to handle. This problem was also multiplied when second shifts were added; the same uneven distribution of workload occurred for these time clerks.

Our next major step was to consider ways to eliminate these department timekeepers who had considerable slack time. Our studies indicated that a communication system, with our hourly shop employees transmitting the labor information from their departments to a central timekeeping location would be our best solution. Consequently, we installed six Vocaline Citizen Band Transceivers and had one time clerk on each shift servicing all the shop employees.

This communication system was satisfactory in itself, but we still had one serious drawback in our method of timekeeping. Job time tickets had to be typed from route process sheets and filed by the timekeeper in part numerical order under each job, before the material and blueprints were transferred to the shop for manufacturing operations to start. This delay for typing of time tickets on rush jobs, such as machine tool repair parts, often played an important part in failing to meet promised delivery dates. Also, in the event that a small night shift was required in any department, either a timekeeper was required or (in some instances) the foreman had to do this clerical function.

THOMAS H. MORTON, Muskegon, 1955, is Treasurer of Morton Manufacturing Company, Muskegon Heights, Michigan. He was graduated from Albion College, Albion, Michigan, with a B.A. degree in Business Administration.

The New System

Last year the question was raised, "Is there any equipment available which would eliminate the time clerk and also avoid the delay factor of having to wait for time ticket preparation?" We devised the present time-recording system which, after one year of use, seems to have answered our questions and solved our problems to our entire satisfaction.

The time-recording units. Six time-recording stations have been placed throughout the plant and consist of the following items: tape recorders, small exhaust fan to dissipate heat, counter driven by synchronous motor 10 r.p.h. and push-to-talk microphone. These are enclosed in a box 24" x 18" x 8" which stands on legs and has an overall height of 39". The box is covered by a piece of hinged clear plexiglass.

Method of reporting time. Over each time-recording unit are two lists of instructions. The general instructions read as follows:

> "Please record information in the order listed on the instruction sheet.
>
> "The button on the microphone starts the tape recorder. Hold the button down until you are through. When the reels are in motion and the green light is responding to your voice, the machine is recording.
>
> "Hold the microphone close and speak with a clear normal voice. It is necessary to hold the microphone close, so that your voice will predominate over the shop noise.
>
> "If you make a mistake, say it over again just as in conversation."

The other instructions relative to information required read as follows:

MACHINE SHOP

"Please state the following information in this order:

1. Your clock number
2. Your machine number
3. Time reading
4. Number of pieces
5. Part number
6. Group number
7. Job number
8. Operation number."

ASSEMBLY DEPARTMENT

"Please state the following information in this order:

1. Your clock number
2. Time reading
3. Job number
4. Group number."

An hourly employee who is normally on direct labor and transfers to an indirect function such as material handling, clean up, salvage, etc., merely gives

a description of the work being performed; the clerk transcribing the tapes assigns the indirect labor account number.

Method of transcribing of tapes. Each morning the tapes are collected and are transcribed during that day. The clerk, with earphones and foot pedal on a playback tape recorder, writes the time tickets as the employees give the required information on the tape. An open or current pile of time tickets is filed by employee clock number and, as each person reports in, his time reading becomes the starting time for the new job ticket and likewise becomes the ending time on his ticket in the open file. This closed ticket is then put aside for time calculation later in the day. The same transcribing operation is continued until all six tapes are finished.

In the event that the information given is not complete, the transcribing clerk contacts the foreman of the department of the employee reporting, and more information can be determined at once. The more current the transcribing the easier it is to obtain this missing information. From our experience, however, we have only to check with the foremen three or four times a week altogether. Occasionally, employees transpose numbers or give wrong time readings, but these are easily corrected. The foreman helps the employee with constructive suggestions for improvement in recording.

Time calculation. The time on the closed job tickets is easily calculated in that the master time clock which controls the counters stops for the lunch period. The counters are graduated in tenths of hours and run to 999.9 hours and start again at 000.00. For example, a ticket punched in at 863.7 and out at 864.8 would have 1.1 hours. The elapsed time from one day to another for jobs lasting over shifts is calculated as follows:

Day-shift employees working 8 hours = elapsed time 15.3 hours.
Day-shift employees working 9 hours = elapsed time 14.3 hours.

A record is kept each day for each employee to determine how many hours he worked the previous day and if any tardiness occurred. This would, of course affect the elapsed time calculation. At the end of the week, all job time tickets in the open or current file are closed out and new cards are made out for the beginning of the next week. Those indirect labor employees, such as crane operators, shipping clerks, stockroom attendants, etc., who do not change from one labor account to another, do not report in on tapes. A card is turned in for them each week with their total hours taken from their payroll time cards.

Advantage of the New System

The new method has given new efficiency to time recording and distribution.

We have realized the following advantages:

1. It lends itself to easy expansion and contraction of the timekeeping workload. We have completely eliminated the requirement for a second timekeeper, such as we experienced under the other system. We can expand operations to a second and third shift and still have the transcribing done by the one clerk.
2. The tickets are transcribed each morning and the completed machine operations are checked off in the machine shop foreman's production book. This is 24 hours earlier than we were able to do it previously.
3. We have estimated annual savings of $5,000 in clerical help. Transferring this operation into the main office eliminates the waste of time spent by employees in talking with time clerks.
4. With the timekeeping on tapes, the transcribing can be delayed for a few days without serious consequence, if there are employee absences which affect the processing.

In summary, we feel this new system of our timekeeping has given us many advantages not previously enjoyed. In use for over one year, we have yet to find an important flaw in the system, which certainly denotes complete satisfaction.

Punched Card Invoicing for Wholesale Bakery

by SAM S. CASCONE, JR.

CUTTING COST and saving time in office accounting can contribute to a company's profits just as surely as does the introduction of a successful new product in the market. It provides the organization with a tool by which to increase the efficiency and obtain extra business. Those are the results that have been achieved at Mother's Cake & Cookie Co. with a punched card system of invoicing and billing that begins even before a delivery is made. It has provided meaningful, accurate sales statistics fast enough to make them useful in selling. It has reduced materially the information our driver-salesmen must record when they deliver to a retail outlet.

Each of these 100 driver-salesmen and 30 independent distributors is supplied each week with a set in duplicate of multi-purpose punched cards for each account. These cards are pre-punched and interpreted (printed) so that all the salesmen must do when he completes a delivery is to insert a carbon sheet, write in the date and quantity purchased, make the extensions and compute the total. It is signed by the customer, who is given the original of the invoice card. Thus, invoicing is performed on the spot. The duplicate card is sent to the home office where it will be used as a direct input to the data processing cycle to initiate accounting and statistical operations.

How the Company Benefits

We have tremendously increased our billing efficiency, made it practical to convert the major portion of our sales volume to a credit basis and increased our accuracy many times by minimizing the possibility of error in transcribing information from handwritten source documents, all this without any elaborate installations. Conversion to the currently effective credit system has made it possible for us to deal more extensively and easily with buying organizations, chain stores and the smaller individual proprietorships. Our average invoice cost, incidentally, is less than a quarter of a cent, thereby reducing our forms costs substantially.

Although our sales volume has doubled in the past five years, it has not been necessary to add personnel to handle the increased processing involved in

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SAM S. CASCONE, JR., Oakland-East Bay Chapter, 1960, is Data Processing Manager with Mother's Cake and Cookie Company, Oakland, California. Formerly, he was Data Processing Assistant Supervisor with Rheem Manufacturing Company, Oakland, Calif.

billing. Capture of delivery information by retail outlet in punched cards gives us a mechanized method of processing volume and cash discounts as required. Normally, we rebate quarterly.

Master Deck is the Key

The basis for the system is a master deck of cards into which has been punched complete billing information for each customer (Exhibit 1). Each card contains the name and address, credit status, and instructions pertaining to the handling of each account. This master deck is duplicated each week and sent to our drivers with their orders, two to three weeks in advance. The cards are in the order in which the driver calls on his accounts. The customer invoice card contains a printed retail and wholesale price itemization of products. There also is a space for credit allowed for returns.

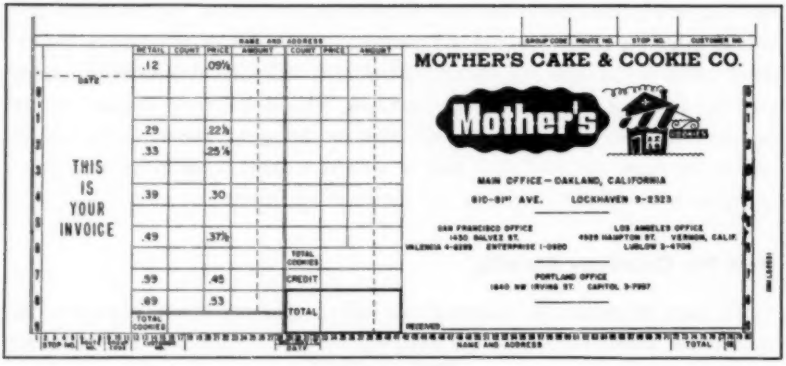

EXHIBIT 1

How Cards Are Processed

At the close of the day, each salesman combines his copy of delivery cards with a daily sales report. As the reports and invoice cards are received in the home office, they are batched by sales territories, extensions are checked and a control total taken for balancing in the data processing system.

This done, cards are then routed to our data processing department where they are visually checked for pencil changes and corrections, and keypunched with the date and amount directly into the same cards. We up-date our master files continually as we receive the information from our credit manager, sales-

man or the customer. The cards displaced from the master file are retained as a "correction deck" which will later be used to search current sales cards in the event we have overlooked a card that was to be corrected. The check deck is used on a collator to select the cards for correction automatically. The cards are trial-balanced to the control totals, sorted and matched with a name and address file. Once the keypunching and checking operations are completed we are ready to prepare a billing recapitulation statement.

Billing Is Streamlined

We close the books for the preceding week on Tuesday morning, allowing time to receive by mail the invoice cards for Saturday's sales. All invoice cards are then processed on an accounting machine. They are listed, the total amount due for each account is added and printed with a subtotal for accounts within groups, and a grand total is established. The original invoice card is sent to the customer and a copy is used by the accounts receivable department for posting. Statements of weekly sales are automatically stuffed into window envelopes and mailed out Wednesday morning.

Sales Analysis for Management

After the statements are prepared, the invoice cards are used to prepare a complete sales analysis, monthly and quarterly, showing sales by store, account and route salesman. Our divisional sales managers use these analyses to compile volume books by customer, year-to-date and compared to the previous year figures. These statistics are very helpful in dealing with the customer as the sales managers know exactly the sales volume involved, as well as its fluctuations.

Customer Rebating Simplified

The quarterly sales analysis becomes the source for computing volume discount, which is done manually in accordance with a sliding scale based on total sales by customer. New cards are keypunched from the quarterly recapitulation, reflecting the rebate amount, and are used to automatically prepare the rebate check and check register.

Generally speaking, we have found the system ideally suited for our large-volume deliveries and we regard it as a vital factor in our sales growth and profit picture.

Beyond These Covers

Books

Accounting in Business Decisions

Homer A. Black and John E. Champion, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1961, 812 pp., $7.95.

The pertinent topic identified in the title of this book discloses the author's endeavor to give emphasis to managerial accounting in a basic text—but not for students only—while retaining the essentials of introductory material on accounting. "Recording and reporting of financial events" occupies the first portion of the text, followed by major sections on "measuring, planning and controlling"—first of "income and working capital," then of "long-term assets and equities."

Accounting Theory and Practice—Advanced

Milroy, Walden & Seawell, Houghton Mifflin Co., 2 Park Street, Boston, Mass., 1961, 673 pp., $7.95.

A third-year text, the present volume is intended by its authors to help make accounting "come alive" to the student, with "a blend of practical considerations [and] full exposition of theoretical aspects." Among the topics treated are instalment and consignment sales, agency and branch accounting, consolidations, receiverships, estates and trusts, and government and institutional accounting. An extended appendix offers case material.

Accounting Systems and Data Processing

Oscar S. Nelson and Richard S. Woods, South-western Publishing Co., Cincinnati 27, Ohio, 1961, 643 pp., $8.00.

The climactic position and substantial attention given to "automated data processing systems" as the third and final "part" of this book relates it to current influences in systems building. The make-up of accounting systems and their analysis for improvement occupy Parts I and II. The text is intended to serve for either graduate or undergraduate courses in this basic specialty of accounting.

Successful Managerial Control by Ratio-Analysis

Spencer A. Tucker, McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y., 1961, 434 pp., $11.

Devoted to a "management control" concept developed by the author, this book penetrates into the details of ratio analysis. The presentation deals with the calculation (by simple arithmetic) and use of ratios to evaluate, and as a result achieve control of, the performance of the many functions of management and aspects of a business enterprise, e.g., the production and sales functions, capital structure, etc.

Manual for School Accounting

Herbert S. Mitchell, Interstate Printers and Publishers, Danville, Illinois, Paper Bound, 1961, 83 pp., $3.

Including a chart of accounts, this manual presents in detail an accounting system for school districts, embracing accounting for funds, income tax procedure, and a number of aspects of school business office practice. The author has been engaged in business management of schools and related consulting work for many years.

Personal Finance

Elvin K. Donaldson and John K. Pfahl, Ronald Press Co., 15 East 26th Street, New York 10, N. Y., Third Edition, 1961, 717 pp., $7.50.

It may not be irrelevant, considering the topic, that this new edition of a text published in 1948 and first revised in 1956 is dedicated to the authors' wives. Budgeting income and expense are early considerations. Attention extends to credit purchasing, borrowing, life insurance, buying real estate, and investing for income and retirement.

Marginal Aspects of Management Practices

Frederic N. Firestone, Bureau of Business and Economic Research, Michigan State University, East Lansing, Michigan, 1960, 80 pp., $3.50.

Economic rather than specifically accounting in character, this compact study of some management approaches to policy formation and decisions includes, for example, the conclusion that "the bulk of the firms (responding to a survey) combine market analysis and accounting analysis in making decisions." Discussion relates to budgetary planning also and other areas in which the accountant is interested.

Modern Production Management

Elwood S. Buffa, John Wiley and Sons, Inc., 440 Park Ave. South, New York 16, N. Y. 1961, 636 pp., $10.25.

Partly out of the accountant's immediate field, the subject matter of this text lies well within the area of his related interests, and he will find in "Cost Data for Decisions" (Chapter 4) a substantial evidence of this relationship. Such evidence is manifested also in the first section of the book, in which inventory and production cost control are dealt with, as well as labor costs and work measurement.

Wholesaling in Marketing Organization

David A. Revzan, John Wiley & Sons, Inc., 440 Park Ave. South, New York 16, N. Y., 1961, 656 pp., $10.50.

A study of the operations involved in wholesaling and its place in the distributions activities of American business, the present work relates to accounting only at scattered points. However, the process dealt with concerns an alternative channel of distribution which many companies are called upon to evaluate. The material would be a serviceable aid to any such investigation.

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